

The Role of Self-Efficacy to Explain the Effect of Counseling Time on Changes in Risky Sexual Behavior among People Living with HIV: A Mediation Analysis

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ABSTRACT

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Risky Sexual Behavior among People Living with HIV: A Mediation Analysis
(Under the direction of Dr. Carol Golin, chair)

Little is known about the amount of motivational interviewing (MI) counseling time needed to reduce risky sexual behavior among people living with HIV/AIDS (PLWHA) or the roles that self-efficacy and motivation to practice safer sex play in the relationship between MI time and sexual risk behavior.

In Study 1, I used hierarchical linear regression models to examine the impact that the amount of MI counseling patients received had on their self-efficacy to practice safer sex. Analyzing data collected in 4 month intervals from a cohort of 490 PLWHA for 12 months (number of observations=1577), I found that patients who received more MI time and a greater number of MI sessions had greater self-efficacy.

In Study 2 hierarchical negative binomial regression was used to examine the association between MI time and sexual risk behavior. I conducted a mediation analysis to evaluate the extent to which changes in self-efficacy and motivation explained the association between predictors and outcome. I conducted analyses from a cohort of 183 PLWHA (number of observations=600) who received safer sex MI at several points over 12 months. I found that as the MI time and number of provided sessions increased over time, participants' sexual risk behavior decreased. I concluded that the effect of counseling time and number of counseling sessions on sexual risk behavior was mediated by self-efficacy to practice safer sex. On the other

hand, motivation to practice safer sex did not mediate the relationship, although I documented a statistically significant positive association between motivation and safer sexual behavior.

These findings suggest that the amount of time spent in MI, whether measured in number of sessions or number of minutes, is an important factor for enhancing safer sex self-efficacy and safer sexual practices among PLWHA. Counseling time has its effect on sexual behavior in part via changes in self-efficacy.

My research suggests that MI based prevention programs for PLWHA need to enhance self-efficacy to practice safer sex in order to ensure a behavior change. My findings provide evidence that more time spent counseling PLWHA can have a positive impact on patient and public health outcomes.

To my daughter, Yasmina Gilmanova

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LIST OF ABBREVIATIONS

Abbreviation	Definition
ACASI	Audio Computer-Assisted Self-Interviews
HAART	Highly Active Antiretroviral Therapy
MI	Motivational Interviewing
PLWHA	People Living with HIV/AIDS
SCT	Social Cognitive Theory
TRA	Theory of Reasoned Action
TRB	Transmission Risk Behavior (Unprotected Anal/Vaginal Sex with HIV Negative or Unknown Serostatus Partners)
UAVI	Unprotected Anal/Vaginal Sex with Any Partners

CHAPTER ONE: INTRODUCTION

1.1. Problem Statement

About 55,400 people in the USA became infected with HIV yearly from 2003-2006 (Hall et al., 2008). The majority of these people (84%) acquired HIV through sexual contact with an HIV-positive individual (Hall et al., 2008). Up to one third of HIV-positive people still practice unprotected sex after learning about their seropositive status (Coleman, Rajabiun, Cabral, Bradford, & Tobias, 2009; Courtenay-Quirk et al., 2008; R. J. Wolitski et al., 2010). In addition, it is estimated that between a third (30%) and a half (46%) of sexually transmitted HIV infections in the US are passed on by people who know that they are HIV positive (Janssen & Valdiserri, 2004; Marks, Crepaz, & Janssen, 2006). Therefore, interventions promoting safer sexual behavior for people living with HIV/AIDS (PLWHA) are still needed. A meta-analysis of 12 randomized controlled trials published between 1988 and 2004 demonstrated that behavioral interventions were effective in decreasing STI acquisition and reducing unprotected sex among PLWHA (Crepaz et al., 2006).

Motivational Interviewing (MI) counseling, a counseling style which intends to change behavior by “helping clients to explore and resolve ambivalence” (Miller & Rollnick, 1991), is a promising intervention approach to reduce risky behaviors of PLWHA (Bryan, Fisher, Fisher, & Murray, 2000; DiIorio et al., 2003; S. C. Kalichman, Kelly, & Rompa, 1997; Naar-King et al., 2006; Parsons, Golub, Rosof, & Holder, 2007). However, the relationship between the amount of MI counseling time (dose) administered to the client and practicing safer sexual behaviors by PLWHA is not known.

Several studies support the important role that self-efficacy and motivation to practice safer sex play in influencing safer sexual behaviors (Basen-Engquist, 1994; Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; Goldman & Harlow, 1993; Goodhart, Jemmott, & Boccher-Lattimore, 1992; Reitman et al., 1996). Enhancement of self-efficacy and motivation to practice safer sex is a significant component of several effective behavioral change interventions (Carey et al., 2000; Naar-King, Parsons, Murphy, Kolmodin, & Harris, 2010; O’Leary, Jemmott, & Jemmott Iii, 2008; Schmiege, Broaddus, Levin, & Bryan, 2009). Supporting self-efficacy and motivating people to change their behaviors are two main principles of MI (Miller & Rollnick, 1991). While the optimal amount of MI is not known, studies have demonstrated a positive association between the amount of MI delivered and improved outcomes (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005). However, in reviewing studies of MI, I identified no existing empirical support to confirm that the effect of MI dose on outcomes occurs through its effect on self-efficacy or motivation. To develop the most effective MI interventions, it is important to explore the mechanism by which MI counseling works, and what contributes to its effectiveness (Longabaugh, 2001).

Moreover, to my knowledge, no study has analyzed the relationship between the amount of MI counseling time delivered and: a) self-efficacy to practice safer sex; b) motivation to practice safer sex. From a cost standpoint, it would be helpful to understand whether an investment of more MI time is better for enhancing patients’ self-efficacy, their motivation to practice safer sex, or both self-efficacy and motivation.

Lastly, the majority of studies of factors associated with practicing unsafe sex among PLWHA are cross sectional. The proposed study will examine this relationship using a longitudinal study design with repeated measures. This approach provides greater confidence in

establishing causality compared to using data from a cross-sectional design by offering more information about the temporality of change. It also allows us to address several alternative explanations for the effects, such as the existence of omitted variables.

This study aims to analyze whether the dose of MI contributes to changes in sexual risk behavior and, if it does, to what degree the effect occurs through increased self-efficacy and greater motivation to practice safer sex.

1.2. Study Aims

The aims of the proposed study are the following:

1. To analyze the degree to which time spent in safer sex MI by HIV-positive patients predicts patients':
 - a) self-efficacy for practicing safer sex;
 - b) motivation for practicing safer sex;
2. To analyze the degree to which time spent in safer sex MI predicts sexual risk behavior among HIV-positive patients seen in one of three North Carolina clinics;
3. To analyze the roles of self-efficacy for practicing safer sex and motivation to practice safer sex as mediators in the relationship between safer sex MI time and patients' sexual risk behavior.

I will address the study aims by conducting secondary data analysis of the data from the SafeTalk study. The data for the proposed study were collected at baseline and three follow-up time points (approximately 4, 8 and 12 months after baseline). SafeTalk is a two-armed, randomized controlled trial of a safer sex intervention among 490 patients attending one of three clinics in North Carolina. It aims to examine the effect of MI on changes in participants' risky

sexual behaviors, and whether these changes occur through changes in self-efficacy to practice safer sex.

The proposed study should help us identify the factors that are associated with a reduction in sexual risk behaviors of PLWHA. Also, the study will contribute to understanding the dose-effect relationship of MI counseling. Finally, it will help us explore the mechanisms through which MI counseling works and what contributes to its effectiveness.

1.3. Organization of the Dissertation

The dissertation has six chapters. In Chapter 1 I present a problem statement and outline the study aims. Chapter 2 contains a review of the relevant literature, provides a brief overview of the HIV epidemic in the United States, describes the rationale for HIV prevention programming for PLWHA (known as “Prevention with Positives”), and reviews studies of the efficacy of “Prevention with Positives” interventions. This section also summarizes factors identified in studies as influencing risky sexual behavior among PLWHA, with an emphasis on the role of self-efficacy and motivation to practice safer sex. Chapter 3 presents the research questions, hypotheses, and conceptual model to be tested. Chapter 4 and 5 contain two manuscripts entitled: 1) The Relationship between MI Time and Self-Efficacy to Practice Safer Sex in a Sample of PLWHA and 2) The Role of Self-Efficacy and Motivation in Explaining the Effect of Counseling Time on Changes in Risky Sexual Behavior among PLWHA: a Mediation Analysis. Chapter 6 is a summary of the key findings, including a discussion of their implications, and recommendations for future HIV prevention research and practice.

CHAPTER TWO: REVIEW OF THE LITERATURE RELEVANT TO THE DISSERTATION

This chapter: 1) presents an overview of the HIV epidemic in the United States, including an historical overview of and rationale for approaches to HIV prevention use with PLWHA, so-called “Prevention with Positives”; 2) describes factors associated with risky sexual behavior among PLWHA; 3) reviews the efficacy of “Prevention with Positives” interventions; 4) reviews the literature evaluating whether the amount of time spent with clients during a counseling intervention (dose) influences the effect of the intervention (for counseling in general as well as HIV prevention and MI counseling specifically); and 5) examines the studies assessing the mediating effect of self-efficacy and motivation to practice safer sex in the relationship between the dose of MI and sexual risk behavior.

The chapter concludes with a summary of shortcomings of previous research on MI dose-outcome relationships, and mediation analysis of MI.

2.1. Human Immunodeficiency Virus (HIV) is an Important Epidemic in the United States

HIV (human immunodeficiency virus) currently affects as many as 1,106,400 Americans among the 33.4 million people infected worldwide and continues to newly infect individuals each year (CDC, 2008a; UNAIDS, 2009). In the United States, from 2003 to 2006, about 55,400 people became newly infected with HIV each year (Hall et al., 2008). By 2007, AIDS had killed about 576,000 Americans since it was first recognized in 1981 (CDC, 2008c).

HIV disproportionately affects men who have sex with men, African-Americans, and impoverished and uneducated people in the United States. The majority of PLWHA in the US are men who have sex with men (MSM) (CDC, 2008a). According to the Center for Disease Control and Prevention (CDC), in 2006 sex between men accounted for 53% of newly diagnosed infections among men; high-risk heterosexual contact accounted for 31%, and injection drug use accounted for 13% of new infections (CDC, 2008b). Among women newly infected with HIV in 2006, 80% were infected through heterosexual contact, 20% through injecting drugs. For many women, the undisclosed risky behavior of male partners, such as having sex with other men and injecting drugs, is the main factor in their acquiring HIV (Montgomery, Mokotoff, Gentry, & Blair, 2003). Racial disparities are evident as almost half (45%) of people infected in 2006 were African Americans, although blacks constitute only 13% of the US population in 37 states and five US dependent areas (CDC, 2010).

As behavioral factors put individuals at risk of acquiring HIV, behavioral interventions have been developed to prevent HIV transmission. Early in the epidemic such interventions focused primarily on persons who were not infected with HIV to help them avoid acquiring infection. These interventions sought to help HIV-negative, at-risk individuals avoid risky behaviors, such as having sexual intercourse without a condom, needle sharing, having multiple sex partners, and using substances that reduced behavioral control. However, more recently (since approximately 2003), attention has focused on preventive behavioral interventions that target PLWHA.

2.2. Historical Overview of “Prevention with Positives” Programming in the United States

Historically, most HIV prevention programs focused on high-risk groups or the general population. With few exceptions, prevention programs for HIV-positive people included only one post-test counseling session when they received their HIV test results and were provided assistance with partner counseling (R. Wolitski, Janssen, Onorato, Purcell, & Crepaz, 2005). With the introduction of Highly Active Antiretroviral Therapy (HAART), which increased the longevity of people living with HIV, the need for prevention programs for PLWHA was widely recognized. In 1997, a panel of the National Institute of Health concluded:

“Programs must be developed to help individuals already infected with HIV to avoid risky sexual and substance behavior. This National priority will become more pressing as new biological treatments prolong life. Thus, prevention programs for HIV-positive people must have outcomes that can be maintained over long periods of time, in order to slow the spread of infection” (NIH, 1997).

In 2001, the Centers for Disease Control and Prevention (CDC) announced a new initiative to reduce the risk of HIV transmission from HIV-infected individuals to others. The Serostatus Approach to Fighting the HIV Epidemic (SAFE) aimed to increase the following factors: 1) the number of HIV-infected persons who know their serostatus; 2) the use of health care and preventive services among PLWHA; 3) high-quality care and treatment for people diagnosed with HIV; 4) adherence to HIV therapy among persons diagnosed with HIV; and 5) the number of persons diagnosed with HIV who adopt and maintain behaviors that reduce the risk of HIV and STI transmission (Janssen, 2001).

Two years later in 2003 CDC announced the Advancing HIV Prevention (AHP) initiative which made prevention for HIV positive individuals as important as prevention for HIV negative individuals (Janssen, Onorato, Valdiserri, & Durham, 2003). The three core elements of AHP

included promotion of: 1) HIV counseling, testing, and referral; 2) prevention programs for persons at high risk for HIV; and 3) prevention counseling for persons living with HIV. AHP also provided financial resources to support community-based programs aiming to prevent new infections by working with persons diagnosed with HIV and their partners (Janssen, Onorato, Valdiserri, & Durham, 2003).

Moreover, as a part of this initiative, in 2003 the CDC issued guidelines recommending that all medical providers giving care to PLWHA incorporate HIV prevention initiatives into the routine medical care they provided to persons living with HIV. According to the recommendations, medical care providers should attempt to reduce HIV transmission by routinely screening HIV-infected patients for risk behaviors, while communicating prevention messages, discussing sexual and drug-use behavior, and positively reinforcing changes for safer behavior (CDC, 2003).

2.3. Rationale for “Prevention with Positives”

2.3.1. “Prevention with Positives” Started with the Introduction of HAART

The introduction of Highly Active Antiretroviral Therapy (HAART) in 1995-1996 has greatly improved the health of people living with HIV. HAART is a combination of several drugs which prevent replication of the HIV virus, often rendering the amount of virus in a person’s blood (viral load) undetectable. However HAART does not completely eliminate the virus from a person’s body. The introduction of HAART has extended and improved the quality of the lives of HIV-positive individuals. Due to advances in HIV treatment, the number of deaths and AIDS diagnoses due to HIV has significantly decreased over time (Karon, Fleming, Steketee, & DeCock, 2001).

As the number of deaths from HIV has fallen, the number of PLWHA in the US has increased. Approximately 1,106,400 people were living with HIV/AIDS in 2006 (CDC, 2008a). HIV incidence was stable at approximately 55,400 new infections per year between 2003-2006 (Hall et al., 2008). Due to the stable incidence rate and the decrease in number of AIDS-related deaths, the number of PLWHA is expected to continue to rise in the future (R. Wolitski, Janssen, Onorato, Purcell, & Crepaz, 2005).

2.3.2. The Majority of People Living with HIV/AIDS (PLWHA) are Sexually Active and a Substantial Minority Practice Unsafe Sex

Most HIV positive people are sexually active (Erbelding, Stanton, Quinn, & Rompalo, 2000; Richardson et al., 2004). Studies indicate that more than 70% of HIV positive men and women have sex after they become aware they have HIV (Crepaz & Marks, 2002). Furthermore, studies indicate that a substantial minority (on average approximately 30%) of HIV-infected persons are not only sexually active, but also practice unsafe sex (Coleman, Rajabiun, Cabral, Bradford, & Tobias, 2009; Courtenay-Quirk et al., 2008; R. J. Wolitski et al., 2010). The CDC report states that “a substantial number of HIV infected people continue to engage in behaviors that place others at risk for HIV infection” (CDC, 2003)

In addition to transmitting the virus to HIV negative partners, unsafe sex can result in co-infection of PLWHA with other sexually transmitted infections, as well as their developing super-infection with other HIV strains (Blackard & Mayer, 2004; Hammer et al., 2008; D. M. Smith, Richman, & Little, 2005). Moreover, HIV-positive persons on treatment may spread antiretroviral resistant strains of HIV to HIV-negative persons, making further treatment of newly infected persons more complicated (Hammer et al., 2008; D. M. Smith, Richman, & Little, 2005).

2.3.3. Transmission Risk Behavior Is Associated with Beliefs about Effectiveness of HAART

Several studies have demonstrated that unprotected sexual activities increased among PLWHA after they started on highly active antiretroviral therapy (HAART) as patients believed that, after HAART initiation, the risk of HIV transmission was reduced. In fact, after the widespread introduction of HAART in the U.S., the prevalence of unprotected sex and HIV incidence increased, mainly among MSM (Katz et al., 2002; Vanable, Ostrow, McKirnan, Taywaditep, & Hope, 2000). Some HIV-positive persons believe that they cannot transmit HIV when their viral load is low (Venable, Ostrow, McKirnan, Taywaditep, & Hope, 2000). People who believe that their infectiousness level is low may be more likely to engage in unprotected sex than people who do not hold such beliefs (Catz, Meredith, & Mundy, 2001; S. C. Kalichman, Nachimson, Cherry, & Williams, 1998; Venable, Ostrow, McKirnan, Taywaditep, & Hope, 2000).

A meta-analytic review of 25 studies examined the relationship between receiving HAART and sexual risk behavior. Results showed no difference in sexual risk behaviors, such as unprotected vaginal or anal intercourse or inconsistent condom use, among patients receiving and not receiving HAART, or between patients with undetectable and detectable viral loads. However, the likelihood of risky sexual behavior was higher in people who believed that HAART reduced HIV transmission (Crepaz, Hart, & Marks, 2004). These findings indicate that beliefs of patients on HAART about the treatment's influence on HIV transmission can affect their sexual risk behavior, although taking HAART itself does not. Further, Kalichman et al. demonstrated that HIV treatment-related beliefs were significantly related to practicing unsafe sex with HIV-negative partners (S. C. Kalichman et al., 2007).

2.3.4. “Prevention with Positives” Programs are Needed

With more PLWHA and the likelihood of increased sexual risk behavior of patients on HAART, clinicians and researchers are concerned that the incidence of HIV transmission may increase. According to some estimates (Janssen & Valdiserri, 2004; Marks, Crepaz, & Janssen, 2006), about 15,000 new HIV cases stemming from people who are aware of their seropositive status occur in the US annually. Behavioral interventions that target HIV positive individuals would appear to be relevant, timely, and appropriate.

Early in the epidemic, interventions designed to reduce risky sexual behavior among HIV-negative people were also applied to the HIV positive population but were not effective in reducing the risky behavior of HIV-positive people (Cleary et al., 1995). These HIV negative strategies appeared not to meet their needs and did not take into account the realities of living with HIV. These studies suggested that HIV transmission prevention interventions designed specifically to address needs of PLWHA would be required (S. C. Kalichman et al., 2001).

2.4. Factors that Influence Risky Sexual Behavior among PLWHA

To understand the relationship between the characteristics of counseling, such as dose, and changes in risky sexual behavior among PLWHA, it is first important to understand factors known to be associated with this behavior that may potentially be influenced during counseling. The literature reveals three groups of factors that are associated with high risk behavior among PLWHA. The first category is patient characteristics, such as cognitive factors; these include: low self-efficacy (S. C. Kalichman, 1999; Purcell et al., 2006); weak intention to practice safer sex (S. C. Kalichman, Kelly, & Rompa, 1997); negative attitudes towards condom use (Purcell et al., 2006); emotional state (Kennedy et al., 1993; Purcell et al., 2006); not being on HAART (Morin et al., 2008); perceptions of HAART treatment effects (Crepaz, Hart, & Marks, 2004; S.

C. Kalichman et al., 2007); and safer sex communication skills (Crepaz & Marks, 2002). Second, relationship characteristics, such as duration of partnerships (S. C. Kalichman, 1999), type of partner (e.g. regular vs. non-regular) (Crepaz & Marks, 2002; S. C. Kalichman, Rompa, Luke, & Austin, 2002; Purcell et al., 2006), number of partners (Heckman, Kelly, & Somlai, 1998), and serostatus concordance (Kennedy et al., 1993; Posner & Marks, 1996), have been shown to influence safer sex practices. The last group of factors are socio-environmental and situational ones, such as stigma (Clark, Lindner, Armistead, & Austin, 2003; Vanable, Carey, Blair, & Littlewood, 2006), social support (R. Smith, 2008), peer norms (S. Kalichman, Malow, Dévieux, Stein, & Piedman, 2005; Purcell et al., 2006), and concurrent substance use problems (S. C. Kalichman, 2000; Morin et al., 2007). In the next sections I review in detail some of the psychosocial and socio-environmental factors that are associated with high risk behavior among PLWHA.

2.4.1. Self-Efficacy to Practice Safer Sex

The concept of self-efficacy has been used successfully to explain health behaviors and predict health behavior change and maintenance in a broad range of settings. It was developed by Albert Bandura as part of the Social Cognitive Theory and asserts that the behavior of an individual is influenced by a number of intra- and interpersonal factors (Bandura, 1977). The self-efficacy construct from Social Cognitive Theory has been integrated into other theories of health behavior, such as the Health Belief Model and Transtheoretical Model of Change. Self-efficacy refers to an individual's confidence that he/she can effectively perform a certain behavior under specified conditions (Bandura, 1977). According to the theory, people's beliefs and perceptions about their capabilities influence their behavior, the amount of effort they put into a task, their emotional response to the task as well as their motivation and ability to apply

certain skills to the task. From a social cognitive perspective, an individual may have knowledge of the HIV virus transmission links, skills to negotiate condom use, peer support to practice safer sex but if he/she lacks self-efficacy to do so, the likelihood of having safer sex will still be very low. Thus, self-efficacy plays a more indirect role than some other factors in determining whether a person practices safer sex, how much effort he/she devotes to practicing safer sex, and how persistent he/she will be if difficulties occur. Self-efficacy is task-specific and situation-specific and is a function of individuals' beliefs, attitudes, demographic characteristics, knowledge, and learned skills. Thus, for example, a person can feel confident about medication adherence but not feel confident about condom use during sexual intercourse, or confident about condom use with one partner but not with another.

Self-efficacy reflects a person's perceived capabilities, not true abilities. Self-efficacy plays a significant role in predicting health behavior change in such areas as cigarette smoking, weight control, contraception, alcohol abuse, adherence to exercise programs, and recovery from myocardial infarction (O'Leary, 1985; Strecher, DeVellis, Becker, & Rosenstock, 1986). A review of research studies conducted by Strecher and colleagues established a relationship between self-efficacy and health behavior change and maintenance (Strecher, DeVellis, Becker, & Rosenstock, 1986). Moreover, according to Strecher and colleagues (1986), self-efficacy can be enhanced and, importantly, this enhancement is prospectively related to health behavior change. This finding indicates that when public health interventions effectively build an individual's self-efficacy to implement a particular behavior or to overcome barriers towards practicing a desired behavior, he/she will improve the behavior as well. Once self-efficacy has been built, a person is usually able to make changes in behavior, unless other barriers operate as

well. These findings are important for planning health behavior interventions. They suggest that interventions should target self-efficacy to increase safer sex behavior.

Several studies support the necessity of high levels of self-efficacy in order to practice safer sex. Studies of condom use among college students have demonstrated strong self-efficacy as an important variable predicting condom use (Basen-Engquist, 1994; Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; Goldman & Harlow, 1993; Goodhart, Jemmott, & Boccher-Lattimore, 1992). In a study of self-efficacy and disclosure of HIV-positive status to sex partners, Kalichman and Nachimson (1999) found that low self-efficacy for seropositive status disclosure was associated with no disclosure among both male and female individuals (S. C. Kalichman & Nachimson, 1999). In a study among HIV-positive people with alcohol use disorders, medication adherence self-efficacy was predictive of HIV viral load (Parsons, Golub, Rosof, & Holder, 2007). Another HIV medication adherence study demonstrated the mediating effect of self-efficacy in the relationship between participants' health literacy and their medication adherence (Wolf et al., 2007). A recent study among 1,050 PLWHA at seven HIV clinics in six US cities examined the prevalence and correlates of sexual transmission behavior (C. Golin et al., 2009). The analysis of baseline data established the association between lower self-efficacy for practicing safer sex and a higher likelihood of practicing unsafe sex among homosexual and heterosexual men. As previously discussed, building self-efficacy for practicing safer sex is one of the significant components of behavioral change interventions aimed at reducing unsafe sex.

Understanding the manner by which enhancing self-efficacy helps to change behavior facilitated the development of my hypotheses regarding the association between dose of counseling and behavior change. This may be particularly true for MI because it specifically

targets self-efficacy as an important mediator of behavior change. According to the social cognitive theory, development of self-efficacy for a certain behavior requires the task be divided into small parts that are easy to manage (McAlister, Perry, & Parcel, 2008). An individual should first learn each part through repetition and practice. This simplification of each step and the opportunity to learn each step separately by many repetitions helps to ultimately build self-efficacy for the full task by first building it to implement a particular step. When individuals are confident that they can implement each step, they can combine all the steps and build self-efficacy regarding the entire task. Applying this approach to enhancing self-efficacy for practicing safer sex for PLWHA implies that self-efficacy will need to be developed through more than one episode of counseling.

For example, applying this approach to safer sex counseling, the counselor would first select, with the patient, a simple behavior that the patient could practice, such as carrying condoms all of the time. Once self-efficacy for carrying condoms has been built in, and the behavior of carrying condoms accomplished, the next step, such as taking the condom out of the package correctly would be targeted. Once all of the steps are learned, they could be put together to accomplish a full safer sex practice. Enhancing self-efficacy through a number of performance accomplishments also motivates the client to take on more and more difficult tasks (Strecher, DeVellis, Becker, & Rosenstock, 1986).

2.4.2. Motivation to Practice Safer Sex

Motivation refers to the “forces that determine the direction and intensity of the behavior change effort” (Carey & Lewis, 1999). According to the Fishbein-Ajzen theory of reasoned action (TRA), two factors influence motivation: 1) attitudes (i.e. evaluation of advantages and disadvantages of a behavior) and 2) subjective norms, or perceptions of what significant others

think about the behavior in question. Moreover, to increase motivation, counselors can enhance either attitudes and norms together, or each concept individually (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

The motivational construct of the TRA became one of the main components of the information-motivation-behavioral skills model (IMB) which was specifically designed to “understand and predict the practice of AIDS-preventive acts” (J. D. Fisher, Fisher, Williams, & Malloy, 1994) and to promote and evaluate AIDS-risk behavior change (J. D. Fisher & Fisher, 1992). According to the information-motivation-behavioral skills model, “AIDS-risk reduction is a function of people’s information about AIDS transmission and prevention, their motivation to reduce AIDS risk, and their behavioral skills for performing the specific acts involved in risk reduction” (J. D. Fisher & Fisher, 1992). Thus, people might have information about HIV transmission modes and possess skills to practice safer sex, but, without motivation to practice safer sex, they will not engage in safer sexual behavior.

Several studies support the necessity of being motivated in order to practice safer sex. A study among gay men as well as a study among heterosexual university students found that AIDS-risk reduction motivation predicted the AIDS preventive behaviors of the study participants (Fisher et al., 1994). Researchers who conducted a study among seriously mentally ill substance users identified TRA factors, including “pro-condom norms”, which were associated with lower rates of unprotected sex (S. Kalichman, Malow, Dévieux, Stein, & Piedman, 2005). In a study of factors accounting for risky sexual behavior among heroin-addicted individuals, Bryan et al. found HIV prevention motivation to be significantly related to safer sex practices (Bryan, Fisher, Fisher, & Murray, 2000). Due to the important role that motivation to practice safer sex plays in the reduction of risky behavior, many health behavioral

interventions among PLWHA target this construct to achieve behavioral change in this population (Carey et al., 2000; Naar-King, Parsons, Murphy, Kolmodin, & Harris, 2010).

Motivational Interviewing counseling (which will be discussed in detail later) is one example of an intervention that targets not only self-efficacy but also motivation to practice safer sex.

2.4.3. Other Factors that Influence Risky Sexual Behavior among PLWHA

2.4.3.1. Drug Use

The positive association between drug use and unsafe sex behavior is documented across many studies of PLWHA (Benotsch, Kalichman, & Kelly, 1999; Morin et al., 2007; Wilson et al., 1999). Wilson et al documented the association of crack, cocaine, or injected drug use with less consistent condom use during vaginal and anal intercourse among HIV-positive women (Wilson et al., 1999). Similar results were found in a study of sexual practices among HIV-serodiscordant couples (Kennedy et al., 1993). The analysis demonstrated that regular drug users who were also HIV-positive women were more likely to practice unsafe sex (OR= 11.33, $p=0.02$). Another study of HIV transmission risk predictors concluded that study members who were using stimulants, such as cocaine, were more likely to practice unsafe sex with HIV-uninfected or unknown status partners than study members who did not use stimulants (OR=2.44, $p\leq 0.001$) (Morin et al., 2007). Overall, it appears that drug use increases the likelihood of unprotected sex among PLWHA.

2.4.3.2. Alcohol Use

Consistently across a number of studies alcohol use has been found to be associated with an increased likelihood of practicing unsafe sex among people in general, including among PLWHA (Morin et al., 2007; Purcell et al., 2006). Morin et al. (2007) reported an association between alcohol use and transmission risk behavior in a large sample of HIV-positive people

attending 15 clinics across the US. The researchers found that the odds of transmission risk behavior increased with an increase in alcohol use. The odds ratio was 1.94 for those not drinking alcohol daily but 2.60 for those with daily use of alcohol. A study of the factors associated with sexual risk behavior of HIV positive, heterosexual men who used injection drugs found an association between alcohol use during sex and having unprotected sex with HIV-positive main partners (Purcell et al., 2006).

2.4.3.3. Emotional Well-being

I found no studies exploring the extent to which emotional well-being is a factor that predicts practicing unsafe sex by PLWHA. A review of psychological factors associated with transmission risk behaviors among PLWHA concluded that there is “little evidence that emotional states such as depression, anxiety, or emotional distress in seropositive men or women were associated with sexual risk behavior” (Crepaz & Marks, 2002). The literature review of studies examining the relationship between depression and practicing unprotected sex among PLWHA suggest mixed results. For example, an analysis of the relationship among serodiscordant couples revealed that, while HIV-positive partners who were more depressed were less likely to engage in unsafe sex behavior with their partners, they were also more likely to have sexual partners outside their main relationship (Hutton, Lyketsos, Zenilman, Thompson, & Erbelding, 2004). Purcell et al. (2006) reported depression as “a significant correlate” of unprotected sex with HIV-positive casual partners of heterosexual HIV-positive injection drug-using men.

2.4.3.4. HIV Stigma

Stigma related to AIDS is defined as “the prejudice, discounting, discrediting,

and discrimination directed at people perceived to have AIDS or HIV, their loved ones and associates, and the groups and communities with which they are affiliated” (Herek & Capitanio, 1998). People infected with HIV often suffer multiple burdens, including discrimination and stigmatization. Although I did not find any studies linking stigma and sexual risk behaviors directly among PLWHA, recent research demonstrates the influence of stigma on other HIV prevention behaviors, such as medication adherence (Vanable, Carey, Blair, & Littlewood, 2006), disclosure of HIV status (Clark, Lindner, Armistead, & Austin, 2003; Simbayi et al., 2006; R. Smith, 2008) and depression (Vanable, Carey, Blair, & Littlewood, 2006). Several studies demonstrate an association between stigma and unprotected anal intercourse among men who have sex with men (Finlayson, 2007; Preston et al., 2004). A recent literature review of psychosocial factors related to HIV/AIDS suggests that further research is needed on the direction of the relationship between stigma and risk behaviors among PLWHA (Whetten, Reif, Whetten, & Murphy-McMillan, 2008).

2.5. Studies of the Efficacy of “Prevention with Positives” Interventions

Intervention approaches for “prevention with positives” programs vary from program to program. Because few studies compare different approaches, little is known about which approach or combination of approaches is more effective at reducing HIV-positive persons’ risky behaviors. Here I review the main approaches to prevention with positives. Existing interventions include group level counselor- and peer-led “prevention with positives” programs, medical provider-delivered counseling, and individual-level prevention programs.

2.5.1. Group Level “Prevention with Positives” Interventions

Several randomized controlled trials of group interventions (both peer and health professional led) for PLWHA have demonstrated reductions in risky sexual behavior among their

intervention participants, with some also showing reduced sexually transmitted infections in the intervention groups (Janssen & Valdiserri, 2004; S. C. Kalichman et al., 2001; Wingood et al., 2004; R. J. Wolitski, Gómez, & Parsons, 2005). Features common across each of these successful group level “prevention with positives” interventions were the provision of knowledge, skills-building, improved self-efficacy and support to PLWHA. The results of these studies suggest that interventions which take into account the social context and focus on enhancing self-efficacy are most likely to be successful in reducing the risky sexual behavior of PLWHA.

2.5.2. Medical Provider-Delivered Individual Level “Prevention with Positives”

Interventions

Medical providers have the potential to play key roles in reducing risky behaviors of their HIV-positive patients. The providers usually have frequent, structured access to PLWHA. They also may have referent power over patients that is based on patients’ identification with them and feelings of “communality, security and trust” that may result from such power (Lewis, DeVellis, & Sleath, 2002). Many provider-patient communication recommendations are based on a combination of referent and at least one other source of power, such as expert or informational power. Several studies have demonstrated the effectiveness of brief counseling by medical providers in reducing risky sexual behavior of PLWHA. De Rosa and Marks (1998) found that preventive counseling programs for HIV positive men, implemented in outpatient clinics, increased disclosure rates to seronegative partners, and these improvements, in turn, were associated with practicing safer sex. These researchers also found that repetition of the same messages from multiple sources increased disclosure of an individual’s positive status to the sex partners of PLWHA (De Rosa & Marks, 1998). This finding was consistent with previous

research showing that one episode of counseling is not enough to achieve lasting behavior change (Zenilman, Erickson, Fox, Reichart, & Hook, 1992).

Brief (3-5 minutes) provider-delivered counseling was found to be significantly related to changes in sex behaviors in a study by Richardson et al. (Richardson et al., 2004). The results were similar in a study by Fisher et al. in which HIV-positive patients who received HIV prevention counseling from their medical providers reduced significantly their sexual risk behaviors over time compared to patients in a control group (J. D. Fisher et al., 2004).

The recent CDC-funded demonstration project found a similar association between provider-delivered counseling and changes in sexual behavior. The provider-delivered intervention in seven HIV-clinics in the United States resulted in a significant decline in the 3-month prevalence of unprotected anal or vaginal intercourse (UAVI) with any partner among patients in the study (Gardner et al., 2008). Unprotected anal or vaginal sex decreased from 42% at baseline to 23% at second follow-up, with the changes at least partially attributable to medical providers discussing safer sex and initiating risk-reduction plans with their patients during clinic visits. On average, the counseling lasted three minutes. In this demonstration, a positive association was found between the amount of time patients reported receiving safer-sex counseling from their providers and a measurable decrease in UAVI.

In sum, the findings above demonstrate that brief but repeated counseling by medical providers is effective for positive behavioral change of HIV-positive patients.

2.5.3. Counselor-Delivered Individual Level “Prevention with Positives” Interventions

Several studies have targeted prevention measures for PLWHA through individual counseling. For example, one study, based on the Transtheoretical Model which considers behavior change as a stage-based process, promoted safer sex practices among HIV-positive

adolescent hemophiliacs (Butler et al., 2003) who participated in two individual sessions as well as two peer-centered activities. Teens participating in the intervention were more likely to engage in safer sexual behavior, had increased self-efficacy, and greater knowledge about safer sex practices than at pre-test (Butler et al., 2003). Another study provided eighteen in-person or telephone sessions for HIV positive youth. These counseling sessions focused on medical adherence, reduction of unsafe sexual acts and substance use, and improving the youths' quality of life. The proportion of protected sex acts across all partners increased significantly among the participants who received an in-person intervention compared to those in a control group (Rotheram-Borus et al., 2004).

The Healthy Living Project team randomized a diverse sample of PLWHA to receive either 15 individual cognitive behavioral counseling sessions, 90 minutes each, or no intervention (Morin, 2007). The intervention was delivered in three modules of five intervention sessions each which covered topics, such as stress, coping and adjustment, safer sexual behaviors and health behaviors. The program resulted in significantly lower mean transmission risk acts over 5 to 25 months in the intervention group compared with the control group. These studies, like the group level interventions described earlier, provide evidence of effectiveness of counseling interventions with PLWHA.

2.5.3.1. Motivational Interviewing Counseling

Motivational Interviewing Counseling (MI) is a promising approach for individual level intervention programs. Motivational Interviewing is a counseling style which intends to change behavior by “helping clients to explore and resolve ambivalence” (Miller & Rollnick, 1991). Once the readiness of a client to change is assessed, the counselor helps the client move along a continuum to change by building rapport with clients and treating them as experts in their

decision-making. Clients are responsible for making decisions regarding changes in their life. The counseling is guided by five principles: expressing empathy, developing discrepancies, avoiding argumentation, rolling with resistance, supporting self-efficacy (Miller & Rollnick, 1991). Initially designed to treat substance abuse, Motivational Interviewing was later applied to many other behaviors such as smoking cessation, exercise initiation, weight reduction, and safer sex practices (Dunn, Deroo, & Rivara, 2001). A systematic review of 72 randomized controlled trials concluded that Motivational Interviewing in a scientific setting “outperforms traditional advice giving in approximately 80% of studies” (Rubak, Sandbæk, Lauritzen, & Christensen, 2005).

Evidence exists of successful application of MI counseling in interventions targeting behavior of PLWHA, especially in studies related to antiretroviral therapy (ART) adherence. In one of these studies, participants randomized to receive eight MI sessions significantly improved on viral load and CD-4 count indicators at their three month follow-up compared to control group participants (Parsons, Golub, Rosof, & Holder, 2007). Also, their percent dose adherence and percent per day adherence were significantly higher than control group participants’ adherence. Another MI-based study of HIV-infected patients documented success of a three session nursing intervention in improving self-reported medication adherence among the MI group participants (DiIorio et al., 2003). The mean rating of missed medications was significantly lower in the intervention group receiving MI counseling. Another study found an effect of Motivational Interviewing on reductions in sexual risk behavior of young PLWHA (Naar-King et al., 2006). The participants who were randomized to receive four MI counseling sessions significantly decreased their unprotected sex acts and viral load compared to control group participants. Although the number of MI-based interventions with PLWHA is not very

large, the results of the existing studies suggest that MI counseling may be an effective approach for interventions that reduce risky sexual behavior for PLWHA.

2.5.4. Prevention Interventions Reduce HIV Risk Behavior among PLWHA

Consistent evidence exists that prevention interventions targeting sexual risk behavior among PLWHA are effective. A meta-analytic review of twelve randomized controlled trials published 1988-2004 concluded that interventions targeting PLWHA significantly reduced unprotected sex (OR, 0.57; 95% CI, 0.4-0.82) and *Chlamydia trachomatis* or *Neisseria gonorrhea* (Crepaz et al., 2006). The reviewers identified the following intervention characteristics as contributing to the reductions in sexual risk behaviors. They: 1) were based on behavioral theory; 2) were designed to change HIV transmission behaviors; 3) were delivered by health-care providers or counselors; 4) were delivered to individuals on a one-on-one basis; 5) were provided in an intensive manner (>10 intervention sessions, >20 hours); 6) were given over a relatively long duration (>=3 months); 7) were done in medical settings; and 8) addressed safer sex communication skills. Another meta-analytic review concluded that interventions targeting PLWHA were successful in reducing HIV transmission risk by increasing condom use but not by decreasing sexual partner number (Johnson, Carey, Chaudoir, & Reid, 2006). The researchers found that including motivational and behavioral skills components in the interventions contributed to condom use increase among the participants.

2.6. Dose-Effect Relationships

2.6.1. The Relationship between Intervention Exposure and Outcome in HIV Prevention Studies

I found only a few studies that concluded that there were no differences in outcomes between shorter and longer interventions. For example, in a large randomized controlled trial

(Project RESPECT) to prevent HIV and other STDs among HIV-negative patients in STD clinics in Baltimore the researchers found no benefits of the enhanced four session counseling program over a brief two session counseling intervention.

On the other hand, the majority of studies with populations at risk for HIV, including several meta-analytic reviews, have demonstrated a link between the amount of intervention exposure received and a reduction in HIV risk behavior. Darbes and colleagues conducted a meta-analytic review of 35 HIV interventions among heterosexual African Americans that took place from 1988 to 2005 (Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008). The researchers concluded that the efficacy of the interventions was related to the number of sessions and duration of the interventions delivered. Interventions with more than one session, those with sessions happening during more than one day, and those with more than 160 minutes of cumulative intervention time were less likely to report sexual risk behavior among the participants. Another meta-analysis examined the efficacy of 33 international HIV prevention interventions in reducing risky sexual behavior of men having sex with men (Herbst et al., 2005). The success of the interventions was associated with having more than one session, lasting more than four hours, and taking place over at least three weeks (Herbst et al., 2005). Similar results were found in a study of an intervention aimed at reducing frequency of unprotected anal sex among homosexual and heterosexual African-American men (Peterson et al., 1996). The study participants were randomized to receive three intervention sessions, one session or none. The intervention resulted in a greater decrease in frequency of unprotected anal intercourse among the three session intervention group, with only a slight decrease in efficacy in the single intervention group.

Several studies have demonstrated the benefits of repeated counseling in reducing risky sexual behavior of PLWHA. De Rosa and Marks found that preventive counseling programs for HIV positive men, implemented in outpatient clinics, increased disclosure rates of serostatus to seronegative partners (De Rosa & Marks, 1998). The rate of disclosure of serostatus increased with the number of times patients received counseling from medical providers about disclosure and practicing safer sex (De Rosa & Marks, 1998). A similar association between number of provider-delivered counseling and changes in sexual behavior was found in the recent CDC-funded demonstration project in seven HIV-clinics in the United States (Gardner et al., 2008). On average, in these studies, the counseling lasted three minutes. A positive association was found between the frequency of patients' self-reported receipt of safer-sex counseling and a decrease in their unprotected anal or vaginal intercourse with any partner (UAVI) during the interval between baseline and first follow-up. Together these studies and others provide evidence that lengthier intervention exposure is more effective in reducing risky sexual behavior than shorter interventions.

2.6.2. The Relationship between Dose of General Counseling and the Outcome

While some studies, especially those with binge drinkers, did not find that increased dose of counseling resulted in greater health gains (Miller, 2000), numerous studies in mental health psychotherapy, including several meta-analyses, have established a positive association between length of treatment and better outcome. However, the benefits of increased dose may reach a point of diminishing returns at some point (Howard, Kopta, Krause, & Orlinsky, 1986; Polcin, Galloway, Palmer, & Mains, 2004; Shadish, Navarro, Matt, & Phillips, 2000). We must keep in mind, however, that subjects in most of these studies were not randomized to receive different treatment doses (Polcin, Galloway, Palmer, & Mains, 2004). Therefore, the willingness of those

in the intervention arms to stay longer might be explained by a greater motivation to change, which itself may explain some or most of the change (Miller, 2000). One study that randomized depressed clients to receive 8 or 16 sessions of time-limited therapy reported that those receiving 16 sessions improved more than did those getting eight (Barkham et al., 1996). These findings provide evidence that counseling time in psychotherapy is an important component of effectiveness.

2.6.3. The Relationship between Dose of MI Counseling and the Outcome

Many researchers agree that MI is more effective compared to traditional counseling, at least partly because it takes less counseling time to achieve similar outcomes (Burke, Arkowitz, & Menchola, 2005; Stephens, Roffman, & Curtin, 2000). However, these studies often conclude that the “optimal” MI dose to produce various behavioral changes is not known. Rollnick and Miller have questioned for some time how brief MI counseling can be while still retaining the essence of the MI method, that is, in capturing the main MI techniques and principles (Rollnick & Miller, 1995).

Two systematic reviews of randomized controlled trials of MI counseling have concluded that the likelihood of achieving an effect is directly related to the duration of the MI counseling and to the number of encounters clients have with counselors (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005). A systematic review and meta-analysis of 72 randomized controlled trials found studies with 60-minute sessions to be effective in 81% of cases (26/32) as compared to trials with 20 minutes per encounter, which were effective in only 64% of cases (7/11) (Rubak, Sandbæk, Lauritzen, & Christensen, 2005). Also, studies with one counseling session were less likely to be effective (40%) than studies with more than five encounters (87% effective) (Rubak, Sandbæk, Lauritzen, & Christensen, 2005). Burke and

colleagues established a significant dose-effect relationship in a meta-analysis of 30 controlled clinical trials on Adaptations of Motivational Interviewing (AMI). After conducting regression models and homogeneity analysis, the authors concluded that a higher dose of counseling was associated with better outcomes (Burke, Arkowitz, & Menchola, 2005). Polcin et al. (2004) speculates that since the client might stay for some time in the pre-contemplation and contemplation stages of change (Shaffer & Robbins, 1995), providing a greater dose of MI counseling may “allow the client more time to remain in a pre-contemplation stage and work through ambivalent feelings during the contemplation stage”.

MI-based interventions reported in the literature vary from five to 360 minutes (Dunn, Deroo, & Rivara, 2001). Further research would be useful to estimate “minimum effective dose” of MI and to answer questions about whether “the reported length of MI intervention is related to the observed effect size” (Knight, McGowan, Dickens, & Bundy, 2006; Miller, 2001). To my knowledge, no “Prevention with Positives” interventions have estimated this dose-effect relationship. Since Motivational Interviewing has the potential for promoting safer sexual behaviors among PLWHA, with additional analysis I may be able to establish a specific MI dose-effect relationship. From a cost standpoint, it would be useful to learn whether an investment of more time results in safer sexual practices of PLWHA.

2.6.4. The Relationship between Dose and Self-Efficacy to Practice Safer Sex

Because Social Cognitive Theory emphasizes the need to take small, gradual steps when counseling to enhance clients’ self-efficacy (McAlister, Perry, & Parcel, 2008), this principle might be reflected in the amount of time actually spent in risk reduction counseling. While studies have demonstrated that small or gradual steps are more effective at building self-efficacy, I did not find any studies that examined the contribution of the amount of time a counselor

spends counseling a patient to a patient's self-efficacy levels. Several studies have found that counseling sessions that seek to facilitate behavior change by building self-efficacy of patients to practice safer sex were successful at changing risky behavior (Butler et al., 2003; S. C. Kalichman et al., 2001). To my knowledge, however, no studies have explored the relationship between the amount of counseling patients receive and any changes that occur in their self-efficacy to practice safer sex. Nor did I find any studies that explored this relationship in interventions that focused on changing other health-related behaviors.

2.6.5. The Relationship between Dose and Motivation to Practice Safer Sex

If the transtheoretical model of change, which states that “change requires movement through discrete motivational stages over time” (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994), guides my thinking I may assume that there is positive association between the amount of MI counseling time and motivation to practice safer sex. My literature review, however, did not find any studies that examined this association.

2.7. Mediating Effects

2.7.1. Mediating Effect of Self-Efficacy to Practice Safer Sex

I identified only three HIV prevention studies that conducted mediational analyses of effective interventions (NIMH, 2001; O'Leary et al., 2005; O'Leary, Jemmott, & Jemmott Iii, 2008; Schmiede, Broaddus, Levin, & Bryan, 2009). However, those that have consistently found a mediating effect of self-efficacy for changes in the outcome among people at risk of acquiring HIV. In one study, low-income at-risk men and women randomized to the intervention group received small group HIV risk reduction sessions (NIMH, 2001). The intervention provided information related to practicing safer sex, and opportunities for skills building, such as condom negotiation and condom use. Intervention participants reported greater condom use than did

control participants at all three follow-up times. Mediation analysis revealed that the success of the intervention was partially attributable to changes in safer sex self-efficacy, higher condom use outcome expectancies, more condom use skills, and greater knowledge. In another study, five brief single-session interventions were tested with African American women seeking care at an inner city hospital women's health clinic (O'Leary, Jemmott, & Jemmott Iii, 2008). Skill-based interventions were found to be more effective than control interventions in reducing reported sexual risk behaviors and STD incidence. Self-efficacy for condom use was a significant mediator in the multivariate analysis. Schmiege and colleagues established self-efficacy as a mediator between intervention condition and risky sexual behavior among detained adolescents (Schmiege, Broaddus, Levin, & Bryan, 2009).

Whether similar results could be obtained for interventions providing individual counseling for PLWHA is not known. A trial with seropositive urban men (SUMIT) reported that self-efficacy was not changed by intervention and, consequently, could not be established as the mediator between intervention and behavioral risk reduction (O'Leary et al., 2005). The mediation studies described above analyzed mediation effects for group counseling (O'Leary et al., 2005; O'Leary, Jemmott, & Jemmott Iii, 2008; Schmiege, Broaddus, Levin, & Bryan, 2009), or for combined individual and group counseling (NIMH, 2001), not for the effect of self-efficacy of individual counseling interventions as I intend to do.

To my knowledge, no study to date has looked at the mediating effect of self-efficacy on the relationship between the dose of MI counseling and sexual risk behaviors among PLWHA. Furthermore, I could find no empirical support to confirm that MI individual treatment effect occurs for PLWHA through changes in self-efficacy. Therefore, this research will analyze

whether dose of individual MI counseling contributes to improvement in sexual risk behavior through changes in self-efficacy to practice safer sex.

2.7.2. Mediating Effect of Motivation to Practice Safer Sex

To my knowledge, no previous study has looked at the mediating effect of motivation to practice safer sex on the relationship between dose of MI counseling and sexual risk behavior among any populations. Therefore, this, too, is one of the aims in this dissertation research.

2.8. Summary

In addition to providing a rationale for why it is important to understand the role of motivation and self-efficacy in HIV “Prevention with Positives” counseling, this literature review has revealed shortcomings of the existing research contributing to a comprehension of MI dose-outcome relationships. To my knowledge, the relationship between the dose of MI counseling and changes in sexual risk behavior or PLWHA has not been examined yet. Consequently, mediation analysis to understand the mechanism of the MI dose influence on the outcome has not been conducted either. I do not know whether self-efficacy or motivation to practice safer sex will increase more when the dose of MI is greater. To address this gap in previous research finding, the first manuscript will examine the relationship between the amount of MI time and self-efficacy to practice safer sex in a sample of PLWHA. In the second manuscript I will analyze the relationship between the amount of MI and sexual risk behavior, and the potential mediating roles of self-efficacy and motivation to practice safer sex in this relationship. The ultimate goal of the research presented in this dissertation is to improve the effectiveness of interventions aimed at promoting safer sexual behaviors among PLWHA.

CHAPTER THREE: RESEARCH QUESTIONS, HYPOTHESES, AND CONCEPTUAL MODEL

This chapter presents study specific aims and the research questions and hypotheses associated with each aim. It also presents a conceptual model and describes the proposed relationships in the model that will be tested in this research.

3.1. Research Questions and Hypotheses

3.1.1. Study Aim 1

To analyze the degree to which the amount of time spent in MI by HIV-positive patients predicts their: a) self-efficacy for practicing safer sex; and b) motivation for practicing safer sex

RQ 1.1. What is the association between the amount of MI counseling time HIV-positive individuals receive and their self-efficacy to practice safer sex?

H 1.1.1. The more MI counseling minutes HIV-positive individuals receive, the greater their self-efficacy to practice safer sex.

H 1.1.2. The greater the number of MI counseling sessions HIV-positive individuals receive, the greater their self-efficacy to practice safer sex.

RQ 1.2. What is the association between the amount of MI counseling time HIV-positive individuals receive and their motivation to practice safer sex?

H 1.2.1. The more MI counseling minutes HIV-positive individuals receive, the greater their motivation to practice safer sex.

H 1.2.2. The greater the number of MI counseling sessions HIV-positive individuals receive, the greater their motivation to practice safer sex.

3.1.2. Study Aim 2

To analyze the degree to which time spent in Motivational Interviewing safer sex counseling predicts sexual risk behavior among HIV-positive patients seen in three North Carolina clinics

RQ 2.1. What is the association between the amount of MI counseling time and sexual risk behavior of HIV-positive patients randomized to receive MI risk reduction counseling?

H 2.1. The more MI counseling minutes HIV-positive individuals receive, the lower the likelihood of their engaging in unprotected sex.

H 2.2. The more MI counseling sessions HIV-positive individuals receive, the lower the likelihood of their engaging in unprotected sex.

3.1.3. Study Aim 3

To analyze the roles of: a) self-efficacy for practicing safer sex; b) motivation to practice safer sex as mediators in the relationship between counseling time and patients' sexual risk behavior

RQ 3.1. Does self-efficacy for practicing safer sex mediate the relationship between counseling time and sexual risk behavior of HIV-positive patients?

H 3.1.1. Having more MI counseling minutes leads to greater self-efficacy to practice safer sex which in turn leads to a lower likelihood of practicing sexual risk behavior.

H 3.1.2. Receiving a greater number of MI counseling sessions leads to greater self-efficacy to practice safer sex which in turn leads to a lower likelihood of practicing sexual risk behavior.

RQ 3.2. Does motivation for practicing safer sex mediate the relationship between counseling time and sexual risk behavior of HIV-positive patients?

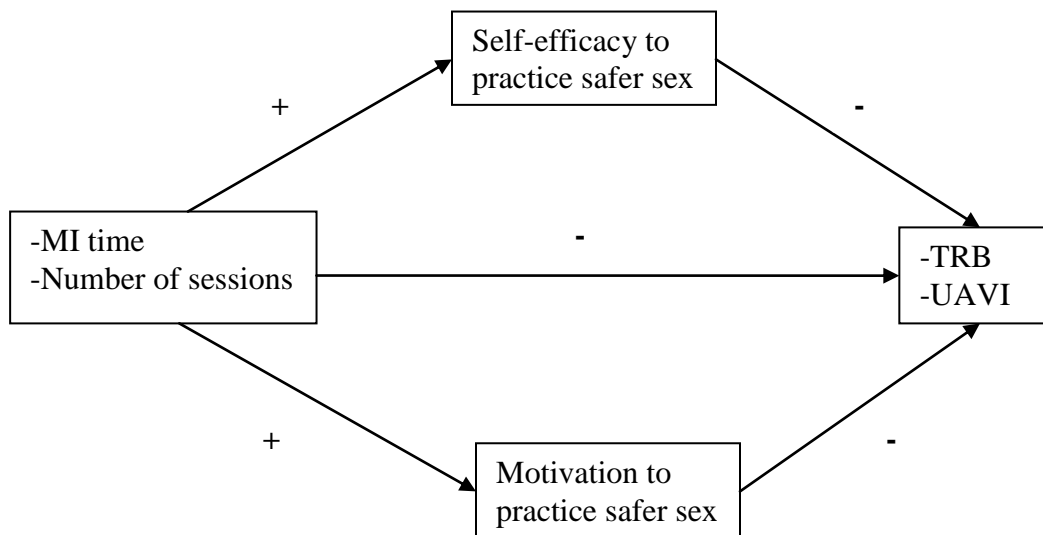
H 3.2. Having more MI counseling minutes leads to greater motivation to practice safer sex which in turn leads to a lower likelihood of practicing sexual risk behavior.

H 3.2. Receiving a greater number of MI counseling sessions leads to greater motivation to practice safer sex which in turn leads to a lower likelihood of practicing sexual risk behavior.

3.2. Conceptual Model

The conceptual model (Figure 3.1.) illustrates visually the relationships (hypothesized above) between the amount of MI time and sexual risk behaviors. The model demonstrates the hypotheses that the relationship between predictor and outcome variables is partially mediated by changes in self-efficacy, and motivation to practice safer sex.

Figure 3.1. Conceptual Model



CHAPTER FOUR: THE RELATIONSHIP BETWEEN MOTIVATIONAL INTERVIEWING TIME AND SELF- EFFICACY TO PRACTICE SAFER SEX IN A SAMPLE OF PEOPLE LIVING WITH HIV/AIDS (PLWHA)

4.1 Abstract

Objective: This study examined the impact of motivational interviewing (MI) sessions on self-efficacy to practice safer sex for PLWHA. I hypothesized that more MI counseling time and a greater number of MI sessions would be associated with greater self-efficacy to practice safer sex.

Design: In 4 month intervals I followed a cohort of 490 PLWHA for 12 months (number of observations=1577).

Methods: I conducted hierarchical linear regression models to examine self-efficacy to practice safer sex over time when participants received zero, low to moderate (1-131 minutes) and high (132-320 minutes) doses of MI counseling. I conducted a similar analysis using the number of counseling sessions (0, 1-2 and 3-4 MI sessions) as the predictor variable.

Results: Participants with low to moderate doses of MI had, on average, 0.26 higher self-efficacy to practice safer sex mean scores than participants with zero MI time ($p=0.01$). On the other hand they had 0.26 lower self-efficacy mean scores than participants with high amounts of MI time ($p=0.04$). Participants with high doses of MI scored, on average, 0.5 points higher on the self-efficacy scale than participants with zero amount of counseling time ($p<0.0001$).

Participants who received 3-4 counseling sessions had, on average, 0.41 greater self-efficacy to

practice safer sex mean scores than participants who did not receive any MI sessions ($p < 0.0001$) but did not differ from participants receiving only 1 to 2 counseling sessions.

Conclusion: MI time, whether measured in number of counseling sessions or minutes spent being counseled, is an important factor for enhancing safer sex self-efficacy among PLWHA.

Practical implications: Self-efficacy to practice safer sex for PLWHA improves the more MI counseling time and sessions PLWHA receive.

4.2 Introduction

Between a third (30%) and a half (46%) of sexually transmitted HIV infections in the US are passed on by people who know that they are HIV positive (Marks, Crepaz, & Janssen, 2006). Up to one third of HIV-infected people still practice unprotected sex after learning about their seropositive status (J. D. Fisher et al., 2004; S. C. Kalichman et al., 2001). In addition to transmitting the virus to HIV negative partners, unsafe sex can result in co-infection of PLWHA with other sexually transmitted infections, as well as the development of super-infection with other HIV strains (Blackard, Cohen, & Mayer, 2002; Blackard & Mayer, 2004; D. M. Smith, Richman, & Little, 2005). Moreover, if they are non-adherent to medications and practicing unsafe sex, HIV-positive persons on treatment may spread antiretroviral resistant strains of HIV to HIV negative persons, further complicating treatment of newly infected persons (Hecht et al., 1998). Many PLWHA, however, face several challenges to practicing safer sex. Understanding how best to assist PLWHA practice safer sex is critical to reducing the spread of HIV and optimizing the health of PLWHA. A meta-analysis of 12 randomized controlled trials of interventions promoting safer sex behavior for PLWHA has demonstrated that behavioral interventions are effective in reducing unprotected sex among them and decreasing STI

acquisition (Crepaz et al., 2006). That same review also noted certain features that were associated with successful interventions (e.g. being theory-based, including skills-building, lasting more than three months total), but to enhance such programs more information is needed.

Motivational interviewing (MI), a counseling style that intends to change behavior by helping clients “explore and resolve ambivalence” (Miller & Rollnick, 1991), is one intervention approach used to reduce risky behaviors of PLWHA (Bryan, Fisher, Fisher, & Murray, 2000; DiIorio et al., 2003; S. C. Kalichman, Kelly, & Rompa, 1997; Naar-King et al., 2006; Parsons, Golub, Rosof, & Holder, 2007). As a person-centered counseling approach, motivational interviewing has underpinnings in Social Cognitive Theory as well as the Transtheoretical Model of behavior change (Miller & Rollnick, 2002). Counselors guide clients toward health changes by expressing empathy, helping them “perceive a discrepancy between where they are and where they want to be” (Miller, Zweben, DiClemente, & Rychtarik, 1992), avoiding argumentation, rolling with resistance, and supporting self-efficacy (Miller & Rollnick, 2002). A systematic review of 72 randomized controlled trials concluded that motivational interviewing in a scientific setting “outperforms traditional advice giving in approximately 80% of studies” (Rubak, Sandbæk, Lauritzen, & Christensen, 2005). Often, however, studies documenting the success of MI conclude that the “optimal” MI dose to produce various behavioral changes is unknown. Rollnick and Miller have questioned how brief MI counseling can be and still retain the essence of the MI method (Rollnick & Miller, 1995). Existing evidence suggests that achieving an effect with MI may be directly related to the duration of the MI counseling as well as to the number of encounters clients have with counselors (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005). No interventions with HIV-infected people, however, have yet estimated this possible dose-effect relationship.

Self-efficacy refers to people's confidence that they can effectively perform a certain behavior under specified conditions (Bandura, 1997). Building self-efficacy for practicing safer sex is one of the significant pathways through which safer sexual behavior change takes place in many interventions, including MI (NIMH, 2001; O'Leary, Jemmott, & Jemmott Iii, 2008). Counseling sessions that facilitate behavior change by building patients' self-efficacy to practice safer sex have been successful at changing risky sexual behavior (Butler et al., 2003; S. C. Kalichman et al., 2001). Supporting self-efficacy and motivating people to change their behaviors are the main principles underlying MI counseling (Miller & Rollnick, 1991). Knowing how best to enhance self-efficacy for practicing safer sex is important therefore to determine. Social Cognitive Theory emphasizes the need for small, gradual steps when counseling clients' to enhance their self-efficacy (Baranowski, Perry, & Parcel, 2002). Spending more time conducting risk reduction counseling may provide clients with more opportunities to take those small steps to enhance self-efficacy.

Although studies have demonstrated that small or gradual steps are effective at building self-efficacy, the exact relationship that exists between dose (defined as the amount of time spent counseling) and building self-efficacy is not known. This article seeks to understand the effect that dose of MI counseling has on self-efficacy to practice safer sex in a sample of PLWHA. I hypothesize that more MI counseling time and a greater number of MI counseling sessions will be associated with greater self-efficacy to practice safer sex.

4.3 Methods

Participants and procedures

I used data collected from July 2006 to May 2009 as part of the SafeTalk study to carry out this research. SafeTalk is a two-armed, randomized, controlled trial of a safer sex intervention conducted among 490 HIV-infected patients receiving care at one of three clinics in North Carolina. The intervention was a multi-component, four session motivational interviewing-based safer sex program. The attention matched control program was a multi-component, four session heart healthy nutrition counseling program. In addition to receiving individual counseling, all participants were given a combined CD and workbook series.

Participants were eligible for the SafeTalk study if they: (1) were HIV infected; (2) were 18 years of age or over; (3) had sex in the past 12 months; and (4) were English-speaking. Potential participants were excluded if they: (1) were cognitively unable to provide consent; (2) were too sick to travel to the clinic; (3) had participated in another “prevention with positives” program in the past 6 months; (4) were in the clinic for their first visit; or (5) intended to leave the clinic within the next 12 months. Recruitment was conducted through prescreening at the main site and with the help of medical providers, nurses, counselors, and social workers at the other two sites. For eligible patients who were interested in participating, the research assistant obtained informed consent after assessing their understanding of the study procedures. Please see the article by Golin et al. for additional details on the SafeTalk study design, procedures and outcomes (C. E. Golin et al., 2010).

Motivational Interviewing (MI) Intervention

Master’s level-trained counselors implemented both the intervention and control programs. Both were designed to deliver four counseling sessions approximately four weeks

apart for sixteen weeks. Individualized confidential booster letters reviewing issues raised in the MI session were sent to participants between sessions. Each intervention MI session was aimed at enhancing motivation and self-efficacy surrounding participants' chosen target behaviors. The first two sessions were designed as the main intervention, with the second two sessions serving as booster sessions. As in many other randomized controlled trials, some participants did not complete all aspects of the program. As a result, 136 participants (54.84%) in the intervention arm received all four MI sessions. The duration of each individual MI session was not prescribed by the protocol but was flexibly determined by counselor and client together. On average, the sessions lasted 40 minutes.

To prepare for each MI session, a CD/workbook series guided participants to perform different exercises, including being asked to rate, on a scale of 1-10, the importance and confidence they felt regarding practicing safer sex.

Each MI session was based on a standard protocol of thirteen steps that allowed the sessions to be individually designed to meet each participant's needs, building on specifically-selected workbook exercises (C. E. Golin et al., 2010). The SafeTalk MI protocol explicitly assessed a participant's current relationship status and sexual activities. Using that protocol, the counselor provided a menu of topics related to safer sex practices from which each participant could choose personal goals. Clients' motivation and self-efficacy to address their chosen behavior was assessed together with barriers and facilitators to behavior change. Counselors provided feedback about clients' individual risk of transmission, and helped them formulate goals and specific strategies to achieve them (Miller, Rollnick, & Moyers, 1998). All seven study counselors received 20 hours of MI training conducted by a MINT (Motivational Network of Trainers) trainer (CEG). Most of the MI sessions were delivered face to face. Receiving

telephone MI counseling was offered to participants with transportation problems. Among those who received any counseling, 15% received some telephone counseling and three percent received only telephone counseling. Every effort was made to ensure that participants received all their MI counseling sessions from the same counselor, and 95% did so.

Study Instruments

Evaluation surveys were administered to study participants at baseline, four, eight, and twelve month visits. Data were collected using audio computer-assisted self-interviews (ACASI). Each interview took place in the clinics, and lasted approximately 40 minutes.

To assess MI session features, immediately after each MI session counselors recorded the content of the session on standardized recording sheets, including: primary and other discussion topics participants selected; reasons participants gave for why the primary discussion topic was important to them; an importance rating; rating of their confidence that they could address the topic; barriers; facilitators; goals set and strategies selected to meet goals. Counselors also recorded time spent counseling and whether counseling was delivered by phone.

Participants received \$15, a parking pass, and a \$5 meal voucher for each counseling session, and \$25 and a parking pass for each completed survey. All participants provided informed consent. The study procedures were approved by the UNC institutional review board.

Dependent Variable of Interest

Self-efficacy to practice safer sex

I measured self-efficacy to practice safer sex using a sixteen-item scale. The scale was adapted from the scales developed by Grimley et al. and Parsons et al. (Grimley et al., 1996; Parsons, Halkitis, Bimbi, & Borkowski, 2000). The original scales had good psychometric properties, and were validated and cross-validated in several settings (Grimley et al., 1996;

Parsons, Halkitis, Bimbi, & Borkowski, 2000). The self-efficacy scale used for the SafeTalk study assessed participants' confidence to conduct a range of tasks required to practice safer sex (e.g., talking about safer sex with a sexual partner, using a condom correctly, using a condom in potentially tempting situations, and negotiating safer sex with sex partners). For example, for each of the sixteen tasks I measured, participants were asked questions, such as "How confident are you that you can convince your partner(s) to use condoms every single time you have sex?" Response options for each item on the 11-point scale ranged from zero for "not at all confident" to ten for "completely confident".

A self-efficacy score for each participant was derived by taking the mean of all responses to the 16 items of the scale. I excluded an observation from my analysis if it had more than four missing values (i.e., more than 25%) on the 16 items. As a result, 18 out of 1577 observations (0.01%) were excluded. At each time point, approximately 85% of the participants replied to all 16 items of the scale. The internal consistency reliability for the self-efficacy to practice safer sex scale in this study sample was high. Cronbach's alpha was 0.92 for the entire scale.

Independent Variables of Interest

a) Amount of MI Time

Although the ideal window was for all four counseling sessions to be completed before the four month survey, some participants did not stay on schedule, and received some of their counseling sessions between the four and eight month surveys (n=102). By design, no counseling sessions took place after the eight month survey. The total amount of counseling time provided by a counselor to a study participant (dose) was calculated for each participant based on information in the data recording sheets for each session. To sum dose received for specified time intervals, I first defined two time intervals: 1) the time period between completing the

baseline survey and the four month follow-up survey; 2) the period between completing the 4 month follow-up survey and the 8 month follow up survey. Dose per interval was then calculated by summing all of the counseling time participants received during time period 1 and during time period 2. For the analyses presented in this article, I used this information to cumulate total counseling time received by each time point. For example, if a participant received sixty minutes of counseling time before the four month survey, and in addition received thirty more minutes of counseling time between the four and eight month surveys, I recorded sixty minutes as the total counseling time by the four month survey, and ninety minutes of total counseling time by the eight month survey.

To facilitate interpretation of the results, I used these data to create three categories for the amount of counseling time received (total number of observations for the sample of 490 participants = 1577). The first group was a “zero dose category” of those participants who received zero minutes of counseling. This group included all observations at which no dose was yet received, including all baseline values and all observations from the 242 people in the control group (67.7%, number of observations = 1067). The second group, labeled low to moderate dose group, included those observations where between 1 to 131 minutes had been received (15.3%, number of observations = 241). The third group was a high dose group and included observations where 132 to 330 minutes total had been received (17%, number of observations = 269). I used a median (131 minutes) as the cut point between the “low to moderate” and “high” dose groups.

b) Number of Counseling Sessions

The total number of counseling sessions provided by counselors to participants was also abstracted from the data recording sheets. Similar to the calculation of the amount of counseling

time above, the number of counseling sessions per interval was calculated by summing all of the counseling sessions participants received during time period 1 and time period 2. The total number of sessions accumulated over time. For example, a participant who received two counseling sessions by the time of the four months survey and one more session by the time of the eight months survey was counted as having two counseling sessions at four months, and three sessions by eight months.

I created three categories for the number of MI counseling sessions: zero sessions (67.7%, number of observations = 1067 including control participants); one to two sessions (8.2%, number of observations = 129); and three to four sessions (24.1%, number of observations = 381).

Covariates of Interest

Because MI dose was not randomly assigned, I measured and controlled for potential confounders, including age, educational attainment, having a main partner (i.e. having a primary relationship defined as living with or seeing someone a lot, feeling a special emotional commitment), being sexually active (i.e. reporting of sexual activity in the past 3 months), sexual identity, date of HIV diagnosis, having an undetectable HIV viral load, clinic site, counselor, proportion of counseling sessions done by telephone, history of previous participation in safer sex motivational interviewing, binge drinking in the last three months, cocaine/crack use in the last three months, and motivation to practice safer sex. Dummy variables were created to represent “having a main partner” or not, being “sexually active” or not, sexual identity (bisexual men, heterosexual men, women), educational attainment (less than high school, high school, greater than high school education), HIV viral load (detectable, undetectable), clinic site (three sites), counselor (seven counselors). Proportion of phone counseling was defined as “the

percentage of phone counseling sessions from the total number of counseling sessions.” Binge drinking was defined as “drinking five or more drinks of alcohol” for men and “four or more drinks” for women in a single day at least once in the last three months. The participants were considered crack/cocaine users if they answered “Yes” to any use, in the last three months, of crack, freebase cocaine, rock cocaine or powder cocaine. To measure motivation to practice safer sex, we used a six item scale adapted from the Sex Check study (Picciano, Roffman, Kalichman, Rutledge, & Berghuis, 2001). Participants were asked to choose answers on a 4-point Likert scale (1=not at all motivated to 4=totally motivated). Participants expressed their level of motivation over the next three months regarding: 1) having safer sex; 2) using a condom every single time they had sex; 3) telling new partners that they had HIV. Participants were asked the same three questions to assess motivation to practice safer sex for both main and casual partners. A motivation to practice safer sex score for each of the participants was derived by taking the mean of all items of the scale.

Analysis

I conducted a descriptive analysis of the study cohort, examined changes in self-efficacy to practice safer sex among participants over all four study assessments, and tested the association between self-efficacy and categories of counseling time. My attrition analysis examined characteristics of study participants lost to follow-up. For this analysis, I conducted logistic regression with participants being present at 12 month follow up as the dependent variable. Demographic, sexual behavior variables at the baseline and counselor identity were the potential predictor variables that I assessed.

I conducted linear regression analysis for longitudinal data using the PROC MIXED procedure in SAS 9.2. (SAS Institute, Cary, NC) since observations for the cohort over time

were correlated within each study participant. A two-level model was used in which units in the first level were study assessments (baseline, 4 months follow up, 8 months follow up and 12 months follow up) that were nested within the units in the second level (study participants). The statistical analysis included all data collected for each study participant at each of the assessments regardless of a participant's intervention exposure.

To handle missing data I conducted multiple imputation using PROC MI to generate possible values. I then used standard SAS procedures to test hypotheses in each of the ten imputed data sets and then PROC MIANALYZE to combine results across the multiply imputed data to produce a single set of test statistics, parameter estimates and standard errors (Rubin, 2004).

I first conducted a global test to see whether there were significant differences in the influence of different categories of counseling time on self-efficacy to practice safer sex. A similar test was conducted with the second independent variable of interest, number of counseling sessions. Then I contrasted different categories of the two independent variables, separately, to test the study hypotheses, adjusting for all potential confounders.

4.4 Results

Study cohort

The sample of 490 study participants consisted of 185 men who had sex with men, 130 men who had sex with women and 161 women who had sex with men. There were 248 participants in the intervention group and 242 participants in the control group. Participants had a mean age of 42.6 years (SD=9.04), 71% were African Americans, 64% were male, 24.6% had less than a high school education, 57.5% earned less than \$10,000 per year. On average,

participants were diagnosed with HIV for nine and a half years ($SD=6.18$). One half (51%) reported undetectable viral loads at baseline, one fifth (18%) had CD4 cell counts less than 200 and 80% were on antiretroviral therapy. About a fifth reported crack or cocaine use, and 40% reported binge drinking in the last 3 months (See Table 4.1.).

In the intervention group, 21.8% ($n=54$) of the participants did not show up to receive any MI (and therefore had no sessions), 33.9% ($n=84$) received 1-131 minutes of counseling time, and 44.4% ($n=110$) received 132-320 minutes of counseling time. For number of counseling sessions, 14.91% ($n=37$) received 1-2 counseling sessions and 63.31% ($n=157$) received 3-4 counseling sessions (See Figure 4.1.).

The logistic regression analysis showed that participants' absence at the last follow up was associated with fewer years since diagnosis ($OR=0.96$, $p=0.0258$) and more motivation to practice safer sex at baseline ($OR=1.56$, $p=0.0018$). Homosexual men were more likely to be lost to follow up ($OR=1.93$, $p=0.008$) compared to females. I found no other differences between those who were and were not lost to follow-up.

Changes in self-efficacy to practice safer sex over time

In the analysis of changes in self-efficacy over time, the significant fixed effects reflected that the mean level of self-efficacy to practice safer sex at baseline was 8.21 ($se=0.09$) and self-efficacy increased by 0.14 ($se=0.023$) per every assessment. The significant covariance between the intercepts and slopes and the standardized correlation of -0.29 indicated that participants who reported higher self-efficacy to practice safer sex at the baseline visit tended to increase self-efficacy more slowly over time.

Effect of the Dose of MI on Self-efficacy to Practice Safer Sex

Figure 4.2. shows that the mean of self-efficacy to practice safer sex increased by categories of the amount of counseling time, unadjusted for potential confounders. Overall, with controls present in the models, self-efficacy to practice safer sex increased as the number of counseling sessions and number of minutes of counseling increased ($p<0.0001$). Participants provided low to moderate doses of MI counseling had, on average, 0.26 higher mean score on self-efficacy than did participants who received no MI counseling ($p=0.01$). Participants with the highest dose of MI counseling had, on average, 0.50 higher mean score on self-efficacy compared to participants who received no MI counseling ($p<0.0001$). They also had, on average, 0.26 higher mean score on self-efficacy compared to participants with low to moderate amounts of MI counseling time ($p=0.04$). Participants who received 3-4 counseling sessions had, on average, 0.41 higher mean self-efficacy score than did participants with no MI sessions ($p<0.0001$) but did not differ from participants receiving only 1 to 2 counseling sessions (See Table 4.2.).

Other findings

Participants with more years of education had, on average, greater self-efficacy to practice safer sex than did participants with fewer years of education. Participants who had graduated from high school and participants with greater than high school education had, on average, greater mean self-efficacy than participants with less than a high school education ($p=0.01$ and $p=0.003$). I found a positive association between motivation to practice safer sex and self-efficacy to practice safer sex ($p<0.0001$). Also, cocaine or crack users had lower self-efficacy to practice safer sex scores than did participants who did not use these drugs ($p=0.0001$).

4.5 Discussion

In this study I found that more MI counseling time and a greater number of MI counseling sessions were both associated with greater self-efficacy to practice safer sex. Specifically, the results of my analysis revealed statistically significant and clinically important differences in self-efficacy to practice safer sex among all three categories of the number of total minutes spent in counseling. Moreover, participants with 3-4 counseling sessions had significantly higher self-efficacy than participants with no counseling sessions although there were no statistically significant differences in self-efficacy between groups with zero and 1-2 counseling sessions. While the optimal dose or dose at which one begins to see a point of diminishing effects is still not clear, these findings suggest that, at least for HIV “prevention with positives” programs, the overall number of minutes spent counseling is a key to promoting self-efficacy to practice safer sex, and two counseling sessions is probably not enough to do so. These findings have critical implications because enhancing self-efficacy has been shown in multiple settings to enhance health behaviors that are linked to health outcomes (Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; Parsons, Golub, Rosof, & Holder, 2007; Wolf et al., 2007). My findings are consistent with previous research, which has established an association between the duration of MI counseling, the number of encounters clients have with counselors, and the likelihood of achieving an effect (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005), although mine is the first study that I am aware of to look specifically at the effects of MI time on self-efficacy. A systematic review and meta-analysis of 72 randomized controlled trials of MI found interventions with 60 minute sessions to be effective in 81% of cases as compared to those with 20 minutes per encounter, which were effective in only 64% of cases (Rubak, Sandbæk, Lauritzen, & Christensen, 2005). Also, studies with one

counseling session were less likely to have an effect on outcomes (40% of studies effective) than studies with more than five encounters (87% of studies effective) (Rubak, Sandbæk, Lauritzen, & Christensen, 2005). Burke and colleagues established a significant dose-effect relationship in a meta-analysis of 30 controlled clinical trials of interventions that were adaptations of motivational interviewing. The authors concluded that a higher dose of counseling was associated with better outcomes (Burke, Arkowitz, & Menchola, 2005). While the mechanism for this association was not known, Polcin et al. speculated that since the client might stay for some time in the precontemplation and contemplation stages of change, providing a greater dose of MI counseling may permit the client more time to remain in a pre-contemplation stage and work through any ambivalence during the contemplation stage (Polcin, Galloway, Palmer, & Mains, 2004).

This study's findings not only contribute to our understanding of how to best deliver HIV counseling to PLWHA, but also do so for MI counseling in general. To my knowledge, this is the first study that attempts to examine the effect of MI dose-on self-efficacy among PLWHA.

In addition to my main study finding regarding the effects of dose, I found several other variables related independently to the level of self-efficacy to practice safer sex, after controlling for exposure to the intervention. My study supported previous research findings that people with lower education tend to have lower self-efficacy to practice safer sex (Marín, Tschann, Gomez, & Gregorich, 1998; Reynolds et al., 2004). Also, the positive association between drug use and unsafe sex behavior is documented across many studies of PLWHA (Benotsch, Kalichman, & Kelly, 1999; Kennedy et al., 1993; Morin et al., 2007; Wilson et al., 1999) although it has not previously been shown specifically to relate to self-efficacy. The association I found between cocaine and crack use and lower self-efficacy to practice safer sex helps us to understand a

potential mechanism by which drug use may affect risky sexual behavior. While I did not aim to establish with this one study the nature of the relationship between dose, self-efficacy to practice safer sex and motivation to practice safer sex, the association I found between self-efficacy and motivation to practice safer sex confirms the importance of directing health behavior interventions at changing each of these constructs. Motivational interviewing's advantage is that it targets not only self-efficacy but also motivation to practice safer sex. Future studies should explore a potential causal relationship among counseling dose, motivation, and self-efficacy to practice safer sex.

There are several study strengths. Using a longitudinal design with repeated measures provides greater confidence in establishing causality compared to using data from a cross-sectional design by offering more information about the temporality of change. It also allows us to address several alternative explanations for the effects, such as the existence of omitted variables. The changes over time occur within an individual. Therefore, every person serves as his or her own control (MacKinnon, 2008). To minimize alternative explanations even further, I included potential confounders, such as motivation to practice safer sex.

My study has several limitations. Because of the sensitive and private nature of sexual health and sexual activity, the study used self-reported data from participants. Self reported data are subject to social desirability and recall biases (Fisher, 1993). These biases were minimized in the study by using computer-assisted interviewing techniques (Gribble, Miller, Rogers, & Turner, 1999; Turner et al., 1998). Social desirability bias were also minimized by asking questions related to the last three month time period rather than the past month (Schroder, Carey, & Venable, 2003b). Also, to measure self-efficacy to practice safer sex, I used a scale with good validity and high reliability.

Absence of randomization to different doses of MI limits my ability to establish causal relationship between the dose of MI received and self-efficacy to practice safer sex. For example, it is possible that those participants who were more motivated to change their behavior received more counseling time and attended more sessions than participants who were less motivated. In contrast, it is also possible that counselors provided more MI time to participants with higher risk sexual behavior compared to participants with lower sexual risk behavior. Also if the quality of counseling had been unequal across counselors, patients may have stayed longer or come back more due to receipt of better quality MI. However, my attrition analysis revealed no difference by counselor. I did find that participants with higher motivation to practice safer sex were more likely to be lost to follow up than participants with lower motivation. Nevertheless, I was able to establish an association between dose of counseling and self-efficacy for the sample of participants who were less motivated to practice safer sex. Also, participants may have increased their confidence that they could practice safer sex as a result of being exposed to the survey questions or because of local events (such as health promotion campaigns) happening during the study period. Although only randomization to a condition may address these threats to internal validity, I minimized them by controlling for potential confounding variables in the analysis.

Finally, threats to external validity exist in this study because the study sites were not randomly chosen for the intervention. Therefore, I may generalize the study findings only to the population of the HIV-positive patients who attended the three study clinic sites or to populations that are similar to these participants. Also, my finding about lower increase in self-efficacy among participants with higher self-efficacy at baseline could be explained by a ceiling effect. Because self-efficacy to practice safer sex at baseline was quite high in general (mean = 8.31,

SD=1.78), I may be underestimating the potential effect that the intervention might have had on riskier groups of participants.

While future studies need to randomize participants to different dose conditions to establish better the dose-effect relationship and to determine an “optimal” amount of MI counseling time, these results demonstrate to clinicians that the amount of time they spend with clients is vital to good care. In an era of budgetary constraints that includes increasing pressure on clinicians and counselors to limit the time they spent with their patients, findings from this study should be seriously considered because it may be that such institutional policies will have a negative impact on patient and public health outcomes.

Table 4.1. Baseline Descriptive Characteristics of the Study 1 Sample (N=490)

	N	%
Demographics		
Age (N, Mean (SD))	487	42.6(9.04)
Ethnicity		
African American	347	71.11
White	100	20.49
Other	41	8.40
Education		
Less than High School	120	24.59
High School	162	33.20
More than High School	206	42.21
Income		
\$10,000 or less	267	57.54
\$10,001 to \$40,000	160	34.48
More than \$40,000	37	7.97
Gender		
Female	172	64.29
Male	315	35.1
Transgender (Male to Female)	2	0.41
Transgender (Female to Male)	1	0.20
Sexual Orientation		
Men having sex with men	185	38.87
Men having sex with women	130	27.31
Women having sex with men	161	33.82
Clinical Characteristics		
Duration of diagnosis (N, Mean (SD))	484	9.53(6.18)
CD4 count < 200	80	18.10
Viral Load		
Undetectable	249	50.92
Detectable	187	38.24
Unaware	53	10.84
Currently on HAART	389	79.39
Behavioral Characteristics		
Substance Use in past 3 months		
Binge drank	192	40.08
Used cocaine/crack	89	19.06
Sexual behavior in past three months		
Had main sex partner	270	56.60
Sexually active	256	52.24

Table 4.2. Effect of the Amount of MI Counseling Time and Number of MI Counseling Sessions on Self-efficacy to Practice Safer Sex in Multivariate Analysis* (N=1577)

Contrast	Estimate (se)	t-Value	Pr> t
Amount of MI Counseling Time			
Low to Moderate vs. Zero Dose	0.26 (0.10)	2.61	0.0090
High vs. Zero Dose	0.50 (0.10)	5.19	<0.0001
High vs. Low to Moderate Dose	0.26 (0.13)	2.01	0.0440
Number of MI Counseling Sessions			
1-2 Sessions vs. 0 Sessions	0.21 (0.13)	1.61	0.1076
3-4 Sessions vs. 0 Sessions	0.41 (0.09)	4.74	<0.0001
3-4 Sessions vs. 1-2 Sessions	0.21 (0.13)	1.59	0.1108
Selected control variables			
High School Education	0.42 (0.16)	2.58	0.0099
Greater than High School Education	0.50 (0.17)	2.96	0.0031
Motivation to practice safer sex	0.80 (0.07)	12.11	<0.0001
Cocaine or Crack Use	0.42 (0.11)	3.90	0.0001

*Controlling for age, educational attainment, having a main partner, being sexually active, sexual identity, date of HIV diagnosis, having an undetectable HIV viral load, clinic site, counselor, proportion of counseling sessions done by telephone, history of previous enrollment in a study providing MI counseling, binge drinking in the last three months, cocaine/crack use in the last three months, and motivation to practice safer sex.

Figure 4.1. Distribution of Intervention Group Participants by Dose and Number of Sessions Received (N=248)

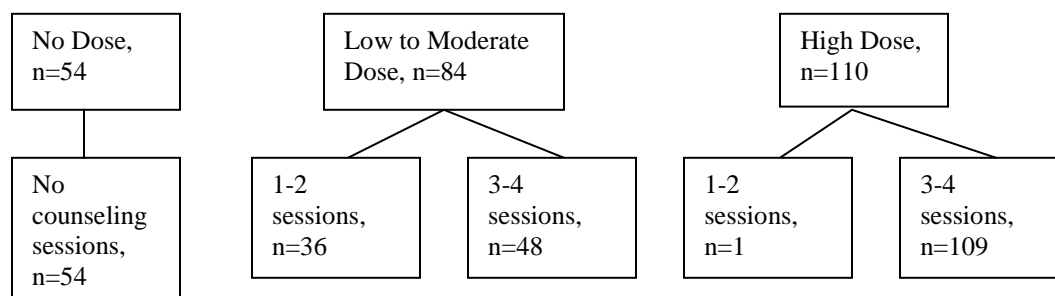
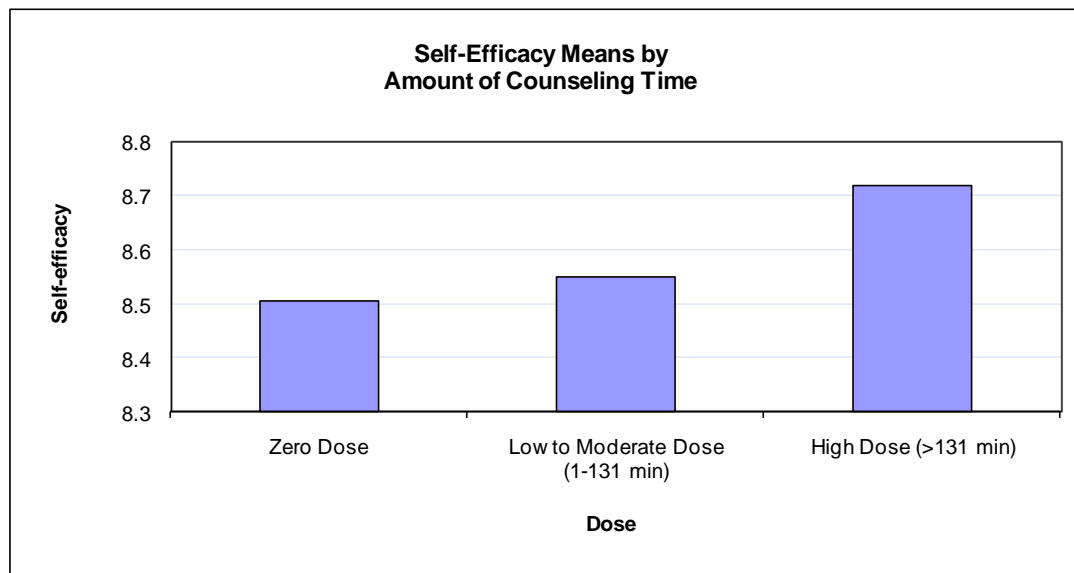


Figure 4.2. Self-Efficacy Means by Amount of Counseling Time



CHAPTER FIVE: THE ROLE OF SELF-EFFICACY AND MOTIVATION TO EXPLAIN THE EFFECT OF COUNSELING TIME ON CHANGES IN RISKY SEXUAL BEHAVIOR AMONG PEOPLE LIVING WITH HIV: A MEDIATION ANALYSIS

5.1 Abstract

Introduction: Little is known about the amount of MI time needed to reduce risky sexual behavior among PLWHA or the roles of self-efficacy and motivation to practice safer sex in this relationship.

Methods: Among a cohort of 183 PLWHA receiving safer sex motivational interviewing, I conducted a secondary data analysis of data collected at 4 month intervals over 12 months (number of observations=600). I used hierarchical negative binomial regression models to examine the association between amount of counseling time and sexual risk behavior. I conducted a mediation analysis to evaluate the extent to which changes in self-efficacy and motivation to practice safer sex explained this association, using a bootstrapping method to create confidence intervals for indirect effects.

Results: As the amount of counseling time and number of provided sessions increased, participants' sexual risk behavior decreased ($p < 0.0001$). The effect of counseling time and number of counseling sessions on sexual risk behavior was mediated by self-efficacy to practice safer sex. Motivation to practice safer sex did not mediate this relationship although I found a negative association between motivation to practice safer sex and risky sexual behavior.

Conclusion: MI time, whether measured in number of counseling sessions or minutes spent being counseled, is an important factor for enhancing safer sexual practices among PLWHA. Counseling time had its effect on sexual behavior in part via changes in self-efficacy to practice safer sex.

5.2 Introduction

Between a third (30%) and a half (46%) of sexually transmitted HIV infections in the US are passed on by people who know that they are HIV positive (Marks, Crepaz, & Janssen, 2006). Up to one third of HIV-infected people still practice unprotected sex after learning about their seropositive status (J. D. Fisher et al., 2004; S. C. Kalichman et al., 2001). In addition to transmitting the virus to HIV negative partners, unsafe sex can result in co-infection with other sexually transmitted infections, as well as development of super-infection with other HIV strains (Blackard, Cohen, & Mayer, 2002; Blackard & Mayer, 2004; D. M. Smith, Richman, & Little, 2005). Many people living with HIV/AIDS (PLWHA), however, face several challenges to practicing safer sex. Understanding how best to assist PLWHA practice safer sex is, therefore, critical to optimizing their health and reducing HIV spread. A meta-analysis of 12 randomized controlled trials of interventions promoting safer sex behavior for PLWHA has demonstrated that behavioral interventions are effective in reducing unprotected sex and decreasing STI acquisition (Crepaz et al., 2006). The review also noted certain features that are associated with successful interventions (e.g. being theory-based, including skills building, lasting more than three months), but more information is needed to enhance such programs.

Motivational Interviewing (MI), a counseling style that intends to change behavior by helping clients “explore and resolve ambivalence” (Miller & Rollnick, 1991), is one intervention

approach used to reduce risky behaviors of PLWHA (Bryan, Fisher, Fisher, & Murray, 2000; DiIorio et al., 2003; S. C. Kalichman, Kelly, & Rompa, 1997; Naar-King et al., 2006; Parsons, Golub, Rosof, & Holder, 2007). Supporting self-efficacy and motivating people to change their behaviors are the main principles underlying MI counseling (Miller & Rollnick, 1991). Self-efficacy refers to people's confidence that they can effectively perform a certain behavior under specified conditions (Bandura, 1997). Self-efficacy can be enhanced and, importantly, this enhancement is prospectively related to health behavior change (Strecher, DeVellis, Becker, & Rosenstock, 1986). Motivation refers to the "forces that determine the direction and intensity of the behavior change effort" (Carey & Lewis, 1999). According to the information-motivation-behavioral skills model, motivation to reduce AIDS risk is one of the three factors contributing to AIDS risk reduction behavior (J. D. Fisher & Fisher, 1992). Enhancement of self-efficacy and motivation to practice safer sex are significant components of several effective behavioral change interventions aimed at reducing unsafe sex (Bryan, Fisher, Fisher, & Murray, 2000; Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; J. D. Fisher, Fisher, Williams, & Malloy, 1994; S. Kalichman, Malow, Dévieux, Stein, & Piedman, 2005; S. C. Kalichman & Nachimson, 1999).

Very few HIV prevention studies have conducted mediational analyses of effective interventions (NIMH, 2001; O'Leary, Jemmott, & Jemmott Iii, 2008) to identify intermediate factors that contribute to a reduction in risky sexual behavior of PLWHA. Once identified, program designers can target specific intermediate variables to make future risk reduction intervention programs more effective. While evidence suggests that building self-efficacy for practicing safer sex is one significant pathway through which safer health behavior change takes place (NIMH, 2001; O'Leary, Jemmott, & Jemmott Iii, 2008), this pathway has not been

assessed for MI specifically. Moreover, the relationship between amount of MI counseling (dose) and practicing safer sex (effect) has not yet been investigated. Therefore, I sought to assess empirically whether the dose of MI counseling that HIV-infected patients received contributed to improvement in sexual risk behavior through changes in self-efficacy and motivation to practice safer sex.

5.3 Methods

Participants and procedures

To address my objectives, I used data collected as part of the SafeTalk study. SafeTalk is a two-armed, randomized, attention-controlled trial of a safer sex intervention conducted among 490 HIV-infected patients receiving care at one of three clinics in North Carolina. Participants were followed for 12 months and assessed approximately every 4 months. Data collection began in July 2006 and was completed in May 2009.

The SafeTalk intervention was a multi-component, four session MI-based safer sex program. In addition to receiving individual counseling, all participants were given a combined CD and workbook series that helped prepare them for each counseling session.

Participants were eligible for the SafeTalk study if they: (1) were HIV infected; (2) were 18 years of age or over; (3) reported having sex in the past 12 months; and (4) were English-speaking. Potential participants were excluded if they: (1) were cognitively unable to provide consent; (2) were too sick to travel to clinic; (3) had participated in another safer sex MI program in the past 6 months; (4) were in clinic for their first visit; or (5) intended to leave the clinic within the next 12 months. Recruitment was conducted through prescreening at the main site and with the help of medical providers, nurses, counselors, and social workers at the other two sites.

For eligible patients who were interested in participating, the research assistant obtained informed consent after assessing their understanding of the study procedures. Please see the article by Golin et al. for additional details on SafeTalk study design, procedures and outcomes (C. E. Golin et al., 2010).

I conducted the analyses reported here with the subsample of participants who were both in the intervention arm (n=248) and reported being sexually active on at least one assessment point during the study (n=183). Thus, I excluded participants who reported having no sex in the last three months during each of the four study assessments because the outcome pertinent to the study was the incidence of unprotected sex.

Motivational Interviewing (MI) Intervention

Master's level-trained counselors delivered the SafeTalk program which consisted of four counseling sessions approximately every four weeks for sixteen weeks. The first two sessions made up the main intervention and the second two sessions served as boosters. Individualized confidential booster letters reviewing issues raised in the MI session were sent to participants between sessions. The duration of each individual MI session was not prescribed by the protocol, but was flexibly determined by counselor and client together. On average, sessions lasted 40 minutes.

Each MI session was aimed at enhancing motivation and self-efficacy surrounding participants' chosen target behaviors. To prepare for each MI session, the CD/workbook series guided participants to perform different exercises, including being asked to rate, on a scale of 1-10, the importance and confidence they felt regarding practicing safer sex. Each MI session was based on a standard protocol of thirteen steps that allowed the sessions to be individually designed to meet each participant's needs, building on specifically-selected workbook exercises

(C. E. Golin et al., 2010). The SafeTalk MI protocol directed the counselor to explicitly assess a participant's current relationship status and sexual activities and to provide a menu of topics related to safer sex practices from which each participant could choose personal goals.

Counselors provided feedback about clients' individual risk of transmission, and helped them formulate goals and strategies to achieve them (Miller, Rollnick, & Moyers, 1998). All seven study counselors received 20 hours of MI training conducted by a MINT (Motivational Network of Trainers) trainer (CEG). Most of the MI sessions were delivered face to face. Telephone MI counseling was offered to participants with transportation problems. Among those who received any counseling (n=148), 14% (n=21) received some telephone counseling and three percent (n=4) received only telephone counseling. Every effort was made to ensure that participants received all their MI counseling sessions from the same counselor. As a result, of those participants who received any counseling, 95% (n=141) received all counseling sessions from the same counselor.

Study Instruments

Evaluation surveys were administered to study participants at baseline, four, eight, and twelve month visits. Data were collected using audio computer-assisted self-interviews (ACASI). Each ACASI took place in the clinics, lasted approximately 40 minutes, and assessed participants' demographic and clinical characteristics, psychosocial factors, attitudes and beliefs, characteristics of sexual relationships, and risky sexual behavior. Patient data about CD4 counts were obtained from the patients' medical records.

To assess MI session features, immediately after each MI session counselors recorded the content of that session on standardized recording sheets, the time spent counseling and whether counseling was delivered by phone.

Participants received a \$15 grocery certificate, a parking pass, and a \$5 meal voucher for each counseling session, and a \$25 grocery certificate and a parking pass for each completed survey. All participants provided informed consent. The study procedures were approved by the University of North Carolina at Chapel Hill's Office for the Protection of Human Research Subjects.

Outcome variables of interest

Transmission Risk Behavior (TRB)

Transmission risk behavior (TRB) was measured as the number of unprotected acts of vaginal and anal sex with any at-risk (HIV-negative or unknown serostatus) partner. Participants were asked a series of questions about the frequency of their sexual behaviors over the past three months, the frequency of condom use, and the serostatus of their partner(s). All these response options were open-ended. The participants entered numerical values to answer the questions.

Participants were asked about the number of times they had vaginal and anal sex with their HIV-positive, HIV-negative, and unknown serostatus partners, respectively. Participants were also asked how many times a condom was used. For the subgroup of men having sex with men, participants were asked about the number of insertive and receptive anal sex acts separately, and frequency of condom use for each type of act. Based on the answers provided, I calculated the total number of unprotected sex acts with HIV-negative and unknown serostatus partners, and summed them for every participant. I treated any item with a value greater than 100 counts as an outlier. In this way I excluded four outliers on this variable.

Unprotected Sex Behavior with Any Type of Partner (UAVI)

Unprotected anal or vaginal intercourse (UAVI) was measured as the number of unprotected acts of vaginal or anal sex with ANY partner. This variable was derived in a similar

manner to the TRB variable. However, unlike that variable, I calculated and summed, for each participant, the number of unprotected acts of vaginal and anal sex HIV positive as well as HIV negative and serostatus unknown partners. I deleted any item with the value greater than 100 counts. Six outliers for this variable were excluded from the analysis.

Independent Variables of Interest

Amount of MI Time (Dose)

Although in planning the study the ideal was for all four counseling sessions to be completed before the four month survey, some participants did not stay on schedule; they received some of their counseling sessions between the four and eight month surveys (n=82). By design, no counseling sessions took place after the eight month survey. The total amount of counseling time provided to a study participant (dose) was calculated for each participant based on information in the data recording sheets for each session. I first defined two time intervals: 1) time period 1 was the interval between completion of the baseline survey and the four month follow-up survey; 2) time period 2 was the interval between completion of the 4 month follow-up survey and the 8 month follow up survey. Dose per interval was then calculated for each of these two time periods by summing all of the counseling time participants received during time period 1 and similarly for time period 2. I then used this information about the dose received during each interval to cumulate total counseling time received by each time interval.

Number of Counseling Sessions

The total number of counseling sessions provided by counselors to participants was also abstracted from the data recording sheets. Similar to the calculation for the amount of counseling time, the number of counseling sessions per interval was calculated by summing all of the

counseling sessions participants received during time period 1 and time period 2. The total number of sessions was cumulative over time.

Mediating Variables of Interest

Self-efficacy to practice safer sex

I measured self-efficacy to practice safer sex using a sixteen-item scale. The scale was modified from scales developed by Grimley et al. and Parsons et al. (Grimley et al., 1996; Parsons, Halkitis, Bimbi, & Borkowski, 2000). The original scales had good psychometric properties, and were validated and cross-validated in several settings (Grimley et al., 1996; Parsons, Halkitis, Bimbi, & Borkowski, 2000). The self-efficacy scale used for the SafeTalk study assessed participants' confidence in conducting a range of tasks required to practice safer sex (e.g. talk about safer sex with a sexual partner, use a condom correctly, use a condom in potentially tempting situations, and negotiate safer sex with sex partners). For example, for each of the sixteen tasks I measured, participants were asked questions such as "How confident are you that you can convince your partner(s) to use condoms every single time you have sex?" Response options on the 11-point scale ranged from zero for "not at all confident" to ten for "completely confident".

A self-efficacy score for each participant was derived by taking the mean of all responses for the 16 items of the scale. A higher score indicated a higher self-efficacy to practice safer sex. I coded a self-efficacy score as missing for my analysis if it had more than four missing values (i.e. more than 25%) on the 16 items. As a result, self-efficacy scores were missing for 22 observations (0.04%). The internal consistency reliability for the self-efficacy to practice safer sex scale in the study sample was high. Cronbach's alpha was 0.92 for the entire scale.

Motivation to practice safer sex

To measure motivation to practice safer sex, I used a six-item scale adapted from the Sex Check study (Picciano, Roffman, Kalichman, Rutledge, & Berghuis, 2001). Participants were asked to choose answers on a 4-point Likert scale (1=not at all motivated to 4=totally motivated). Participants expressed their level of motivation over the next three months regarding: 1) having safer sex; 2) using a condom every single time they had sex; 3) and telling new partners that they had HIV. Participants were asked the same three questions to assess motivation to practice safer sex for both main and casual partners, respectively. A motivation to practice safer sex score for each of the participants was derived by taking the mean of all items of the scale. Similarly to the self-efficacy score, a higher motivation score indicated a greater motivation to practice safer sex. I treated a motivation score as missing if it had more than two missing values (i.e. more than 33%) on the six items. As a result, a motivation score was missing for 21 observations (0.04%). Cronbach's alpha was 0.71 for the entire scale.

Covariates of interest

Because MI dose was not randomly assigned, I measured potential confounders to be able to control for them in analyses. I assessed demographic factors, including age, educational attainment, sexual identity and having a main partner (defined as having a primary relationship defined as living with or seeing someone a lot and/or feeling a special emotional commitment). I also assessed clinical factors, including date of HIV diagnosis, having an undetectable HIV viral load, clinic site, counselor, proportion of counseling sessions done by telephone, history of previous participation in safer sex MI. Third, I assessed: binge drinking in the last three months; and cocaine/crack use in the last three months.

I created dummy variables to represent “having a main partner” or not, sexual identity (bisexual men, heterosexual men, women), educational attainment (less than high school, high school, greater than high school education), HIV viral load (detectable, undetectable), clinic site (three sites), counselor (seven counselors). Binge drinking was defined as “drinking five or more drinks of alcohol” for men and “four or more drinks for females” in a single day at least once in the last three months. The participants were considered crack/cocaine users if they answered “Yes” to any use, in the last three months, of crack, freebase cocaine, rock cocaine or powder cocaine. Proportion of phone counseling was defined as the percentage of phone counseling sessions of the total number of counseling sessions.

Analysis

Descriptive Analyses

I conducted a descriptive analysis of the study cohort, examined self-efficacy, motivation to practice safer sex, TRB and UAVI at each of the four survey assessments. In an attrition analysis, I examined characteristics of study participants lost to follow-up by conducting multivariate logistic regression with participants being present or not at 12 month follow up as the dependent variable and baseline demographic and sexual behavior variables as well as counselor identity as potential predictor variables.

Effect of the Amount of MI on Sexual Risk Behavior

Separate analyses were done for “amount of counseling time” and “number of sessions,” respectively, to see their effects on TRB and UAVI. Because both outcome variables (TRB and UAVI) are count variables, I conducted negative binomial regression analysis. I used the PROC GENMOD procedure in SAS 9.2. (SAS Institute, Cary, NC) since observations for a cohort over time were correlated within each study participant. Negative binomial regression was chosen

because, unlike Poisson regression, it does not make an assumption about equality of mean and variance. A two-level model was used in which units in the first (lower) level were study assessments (baseline, 4 months follow up, 8 months follow up and 12 months follow up) which were nested within the units in the second (upper) level (study participants). The statistical analysis included all data collected for each study participant at each of the assessments regardless of a participant's intervention exposure. The model estimated the difference in the logs of expected counts for one unit change in a predictor variable holding other variables constant in the model.

Mediation analysis

I analyzed lower level mediation since all main variables in my analysis were lower level variables. The upper level was a person and the lower level was a survey assessment. The model tested whether the treatment influenced the mediator which, in turn, affected the outcome. The same mediation analysis was implemented for each of the predictors, for each of the proposed mediating variables and for each of the two outcomes (TRB, UAVI). In each case, three equations were used to assess the mediation effect:

$$\text{Level 1: } f(Y_{ij}) = \beta_{0j} + \beta_c X_{ij} \quad (1)$$

$$\text{Level 1: } M_{ij} = \beta_{0j} + \beta_a X_{ij} \quad (2)$$

$$\text{Level 1: } f(Y_{ij}) = \beta_{0j} + \beta_c X_{ij} + \beta_b M_{ij} \quad (3)$$

where f is a log link function, Y is sexual risk behavior (UAVI or TRB), X is dose of MI at each given time point (“amount of time” or “number of sessions”), M is the value of the mediator (self-efficacy or motivation to practice safer sex). First, I analyzed the relationship between the predictor and the outcome in equation 1. Next, I tested the association between the predictor and the potential mediator in equation 2. Last, I estimated the effect of the predictor on the outcome

adjusting for a potential mediator in equation 3. All potential confounders (described in the “covariates of interest” section above) were included in each of the equations.

The causal step method of Baron and Kenny (1986) has low power to detect mediated effects (MacKinnon, Fairchild, & Fritz, 2007), since the relationship between X and Y variables may be non-significant when the predictor is distal to the outcome (Shrout & Bolger, 2002) or in the case of inconsistent mediation when two or more indirect paths operate in opposite directions (Hayes, 2009; MacKinnon, Krull, & Lockwood, 2000). Therefore, even though I tested the relationship between X and Y, I took a product of coefficients approach to assess mediation. The product of two estimated coefficients, ab (named β_a and β_b above), gave us the mediated effect. To test for its significance, I used a bootstrapping method to create confidence intervals for indirect effects (MacKinnon, 2008) since the Sobel test does not take into account non-normality of the distribution of the ab product (MacKinnon, 2008). MacKinnon and colleagues found that type-I error was more accurate and statistical power was greater when significance tests for the mediated effect are based on the distribution of the product (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Finally, I calculated the percent of the total effect that is mediated using the $ab/(c' + ab)$ measure because it did not require standardizing coefficients to equate the scale across negative binomial regression models (MacKinnon, 2008).

For continuous outcomes in equation 2, I conducted linear regression analyses for longitudinal data using the PROC GENMOD procedure in SAS 9.2. (SAS Institute, Cary, NC) since observations for a cohort over time were correlated within each study participant. For count outcomes in equation 3, I conducted negative binomial regression analysis using the PROC GENMOD procedure in SAS 9.2. Since observation time varied across participants, I used the *offset* option in the model statement to obtain unbiased regression estimates.

5.4 Results

Study cohort characteristics and participation rates

The sample of 183 study participants consisted of 63 men who had sex with men (MSM), 51 men who had sex with women (MSW) and 67 women who had sex with men (WSM). Participants had a mean age of 42 years ($SD=9.58$), 74% were African Americans, 62% were male, 23% had less than a high school education, 60% earned less than \$10,000 per year. On average, participants were diagnosed with HIV for nine years ($SD=6.1$). At baseline, one half (52%) reported undetectable viral loads, and about 80% were on antiretroviral therapy. About a fourth reported crack or cocaine use, and 44% reported binge drinking in the 3 months before the baseline survey (Table 5.1.).

In the study sample, 19.1% ($n=35$) of the participants did not show up to receive any MI counseling, 6.6% ($n=12$) received 1 counseling session, 6.6% ($n=12$) received 2 counseling sessions, 9.3% ($n=17$) received 3 counseling sessions and 58.5% ($n=107$) received 4 counseling sessions.

The 183 participants completed 600 surveys. Of the 183 enrolled at baseline, 154 (84%) were retained at 4-month follow-up, 142 (78%) at 8 month follow-up, and 121 (66%) at 12 month follow-up.

The logistic regression analysis showed that participants' absence at the last follow up was associated with reporting having unprotected sex with any partner ($OR=3.93$, $p=0.01$), being more motivated to practice safer sex ($OR=2.35$, $p=0.02$) at baseline and being an MSM compared to WSM ($OR=2.76$, $p=0.02$). Participants who had taken part previously in another safer sex MI program were more likely to stay in this study than participants who had not

(OR=9.4, $p=0.04$). I found no other differences between those who were and were not absent at the last follow-up.

Means of self-efficacy and motivation to practice safer sex at each time point

Table 5.2 presents the means of self-efficacy and motivation to practice safer sex for each of the four study assessments. As can be seen from the table, on average, self-efficacy increased whereas motivation to practice safer sex decreased over time.

Means and proportion of TRB and UAVI at each time point

Table 5.2 shows the mean number of acts of TRB and UAVI as well as the proportion of participants engaged in TRB and UAVI at each study assessment. Both TRB and UAVI counts decreased from baseline to 4, 8 and 12 month follow-ups. The proportion of participants engaged in TRB and UAVI also decreased from baseline to 4 months, then increased slightly from 4 month values at 8 months but continued to decline from 8 to 12 months.

Effect of the dose and number of counseling sessions on sexual risk behavior

Table 5.3 shows that the difference in the logs of expected counts for both TRB and UAVI decreased statistically significantly as the dose of counseling increased. Thus, with ten minutes increase in counseling time, TRB and UAVI rates decreased by 13% and 8% respectively. Similarly, the difference in the logs of expected counts for both TRB and UAVI decreased significantly as the number of counseling sessions increased. Thus, with one unit increase in number of sessions, TRB and UAVI rates decreased by 57% and 48% respectively.

Mediation analysis

Effect of the amount of MI on self-efficacy and motivation to practice safer sex (a coefficient)

Overall, self-efficacy to practice safer sex increased as the number of counseling sessions ($p=0.001$) and number of minutes of counseling ($p=0.002$) increased (Table 5.3.). Although

motivation was positively associated with self-efficacy ($p < 0.0001$), there was no association between the amount of MI and motivation to practice safer sex.

Effect of self-efficacy and motivation to practice safer sex on sexual risk behavior (b coefficient)

Both self-efficacy and motivation to practice safer sex were negatively associated with TRB and UAVI ($p < 0.0001$). The difference in the logs of expected counts for unprotected sexual intercourse decreased as self-efficacy and motivation to practice safer sex increased (Table 5.3.). A one unit increase in self-efficacy score was associated with a 52% and 39% decrease in TRB and UAVI rates respectively. A one unit increase in motivation scores was associated with a 76% and 68% decrease in TRB and UAVI rates respectively.

Mediation effects

Significant mediation effects of self-efficacy to practice safer sex occur in the relationships between dose and TRB, dose and UAVI, number of sessions and TRB, number of sessions and UAVI (Table 5.3.). Self-efficacy to practice safer sex accounted for approximately 11% of the total effect of counseling dose on TRB, $(0.0022 \times 0.7418 / (0.0022 \times 0.7418 + 0.0128))$. The total effect of dose on UAVI accounted for by self-efficacy to practice safer sex was also equal to 11%. The proportion of total effect of number of sessions on TRB and UAVI mediated by self-efficacy to practice safer sex equaled seven percent.

Since motivation to practice safer sex was not significantly associated with any of the predictors (path *a* in equation 1 above), I cannot conclude that motivation mediates the relationship between dose/number of sessions and TRB/UAVI.

5.5 Discussion

I found that almost 20% of the study participants at baseline reported transmission risk behavior and more than 30% reported having unsafe sex with a partner of any serostatus. This finding confirms yet again a need for further HIV prevention programs for PLWHA in order to reduce the HIV epidemic. Furthermore the overall amount of counseling time, whether measured in number of counseling sessions or minutes spent being counseled, was associated with improvements in safer sexual behavior. Self-efficacy, but not motivation to practice safer sex, mediated this relationship.

My study findings not only contribute to an understanding of how to best deliver HIV counseling to PLWHA, but also add to an insight regarding how to provide optimal MI counseling in general. To my knowledge, this is the first study that attempted to examine the effect of MI dose on sexual behaviors of PLWHA and the role that self-efficacy plays in this relationship.

While the optimal dose is still not clear, these findings suggest that, at least for HIV “prevention with positives” programs, increasing the overall amount of counseling time is a key to promoting safer sexual behavior by enhancing self-efficacy to practice safer sex. Previous research has established an association between the duration of MI counseling, the number of encounters clients have with counselors, and the likelihood of achieving an effect (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005). My study confirms these findings for PLWHA undergoing safer sex counseling. Polcin et al. has speculated that providing more MI counseling may permit the client more time to remain in a pre-contemplation stage and work through any ambivalence he or she may have during the

contemplation stage (Polcin, Galloway, Palmer, & Mains, 2004). My finding suggests that the mechanism by which this effect occurs acts in part via the self-efficacy pathway.

Enhancing self-efficacy has been shown in multiple settings to enhance health behaviors that are linked to health outcomes (Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; Parsons, Golub, Rosof, & Holder, 2007; Wolf et al., 2007). On the other hand, few HIV prevention studies have demonstrated that self-efficacy is the mechanism by which the intervention has improved safer sex practices (NIMH, 2001; O’Leary, Jemmott, & Jemmott Iii, 2008). My findings add to existing research by establishing a mediating role for self-efficacy in a sample of HIV positive people receiving MI counseling.

I cannot conclude that the counseling had an effect on participants’ sexual behavior via changes in motivation because I did not find any association between the amount of counseling and motivation to practice safer sex (path *a*). From the attrition analysis, however, I know that more motivated participants were lost to follow up. It is possible I may have underestimated the potential effect that the intervention would have had on more motivated groups of participants.

In addition to my main study finding regarding the effects of dose, I found that an increase in motivation as well as an increase in self-efficacy was associated with a decrease in risky sexual behavior (path *b*). These findings confirm the importance of aiming health behavior interventions at changing both self-efficacy and motivation, but suggest that self-efficacy, and not motivation, enhancement is more influenced by the amount of counseling received.

Study strengths include the use of a longitudinal design with a diverse sample and repeated measures. These factors provide us with greater confidence in establishing causality compared to using data from a cross-sectional design or from a more homogeneous sample, by offering information about the temporality of change and generalizability of the findings. These

factors also allow us to address several alternative explanations for the effects I found, such as the existence of omitted variables. The changes I observed occurred over time within an individual, with every person serving as his or her own control (MacKinnon, 2008). To minimize alternative explanations even further, I included potential confounding variables in the analysis.

I used count measures (i.e. absolute frequency measures) to assess sexual behavior because compared to categorical measures, counts provide a more informative means to estimate HIV contraction risk (Schroder, Carey, & Venable, 2003a). Also, I used a bootstrapping technique to create confidence intervals for indirect effects. This method provides good accuracy for significance tests for the mediated effect (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

My study has several limitations. Because of the sensitive and private nature of sexual health and sexual activity, the study used self-reported data from participants rather than observational data. Self reported data, however, are subject to social desirability and recall biases (Fisher, 1993). These biases were minimized in the study by the use of computer-assisted interviewing techniques (Gribble, Miller, Rogers, & Turner, 1999; Turner et al., 1998) and asking questions related to the last three month time period rather than the past month (Schroder, Carey, & Venable, 2003b). Also, to measure self-efficacy and motivation to practice safer sex, I used scales with good validity and high reliability.

Absence of randomization of counseling time limits my ability to establish a causal relationship between the amount of MI received and change in sexual behavior. For example, it is possible that those participants who were more motivated to change their behavior received more counseling time and attended more sessions than participants who were less motivated. In contrast, it is also possible that counselors provided more MI time to participants with higher risk

sexual behavior compared to participants with lower sexual risk behavior. It is also possible that if the quality of counseling had been unequal across counselors, patients may have stayed longer or come back more often with some counselors than with others. However, my attrition analysis revealed no difference by counselor. I did find that participants' absence at the 12 months follow-up was associated with having more unprotected sex with any partner and having greater motivation to practice safer sex at baseline. Nevertheless, I am still able to establish an association between the amount of counseling and the sexual risk behavior for the sample of participants who were less motivated to practice safer sex. This association, however, could be due to the loss of participants reporting any UAVI at baseline.

It is also possible that participants practiced safer sex as a result of being exposed to the survey questions or because of local events (such as health promotion campaigns) happening during the study period. Although only randomization to a condition may address these threats to internal validity, I minimized them by controlling for potential confounding variables in the analysis.

I analyzed the mediation effect of self-efficacy and motivation to practice safer sex because supporting self-efficacy and motivating people to change their behaviors are the two main principles underlying MI counseling. However, these are not the only factors that may explain the effect of counseling on changes in sexual behavior. There are likely other mediating variables I did not measure.

Finally, threats to external validity exist in this study because the study sites were not randomly chosen for the intervention. Therefore, readers should exercise caution in generalizing the study findings beyond the population of HIV-positive patients who attended the three study clinic sites or to populations similar to these participants.

While it would be ideal if future studies randomized participants to different dose conditions to better establish the properties of the dose-effect relationship and to determine an “optimal” amount of MI counseling time, as a result of this study clinicians and researchers developing MI interventions for PLWHA should recognize the importance of the amount of time counselors spend with clients. In an era of budgetary constraints that includes increasing pressure on clinicians and counselors to limit the time they spent with their patients, my research findings provide evidence that more time spent counseling PLWHA can have a positive impact on patient and public health outcomes.

Table 5.1. Baseline Descriptive Characteristics of the Study 2 Sample (N=183)

	N	%
Demographics		
Age (N, Mean (SD))	182	41.9(9.58)
Ethnicity		
African American	136	73.73
White	31	17.03
Other	15	8.24
Education		
Less than high school	42	22.95
High school	63	34.43
More than high school	78	42.62
Income		
\$10,000 or less	104	59.43
\$10,001 to \$40,000	58	33.14
More than \$40,000	13	7.43
Gender		
Female	68	37.2
Male	114	62.3
Transgender (Female to Male)	1	0.5
Sexual orientation		
Men having sex with men	63	34.81
Men having sex with women	51	28.18
Women having sex with men	67	37.02
Clinical Characteristics		
Duration of diagnosis (N, Mean (SD))	181	9.18(6.09)
CD4 count < 200	24	14.46
Viral load		
Undetectable	95	51.91
Detectable	66	36.07
Unaware	22	12.02
Currently on HAART	148	80.87
Behavioral Characteristics		
Substance use in past 3 months		
Binge drinking	80	44.2
Cocaine/crack use	44	25.00
Sexual behavior past 3 months		
Had main sex partner	110	62.15
Sexually active	139	75.96
Had TRB	31	17.42
Had UAVI	56	31.46

Table 5.2. Level of Mediators and Outcome Variables over Time

	Baseline Mean (SD)	4-Months Mean (SD)	8-Months Mean (SD)	12-Months Mean (SD)
	<i>n=183</i>	<i>n=154</i>	<i>n=142</i>	<i>n=121</i>
Self-efficacy	8.22 (1.88)	8.56 (1.72)	8.6 (1.68)	8.76 (1.61)
Motivation	3.32 (0.54)	3.26 (0.61)	3.22 (0.59)	3.24 (0.6)
	<i>n=172</i>	<i>n=152</i>	<i>n=140</i>	<i>n=120</i>
UAVI count	2.99 (8.53)	2.28 (7.71)	1.51 (4.0)	2.02 (10.0)
TRB count	1.34 (6.03)	0.79 (4.7)	0.48 (1.65)	0.19 (1.02)
UAVI proportion, %	31.46	23.03	25.71	17.5
TRB proportion, %	17.42	9.21	14.29	6.67

Table 5.3. Models to Test Mediation in the Relationship between the Amount of MI Counseling and Sexual Risk Behavior¹ (N=600)

Outcome	Predictors	β	SE	p	1-e ^{β}
Mediation by self-efficacy					
<i>MI counseling time – Self-efficacy – TRB</i>					
TRB	MI counseling time	-0.0135	0.0041	0.0011	1.3
Self-efficacy ²	MI counseling time	0.0025	0.0008	0.0015	
TRB	Self-efficacy	-0.7418	0.0929	<.0001	52.4
	MI counseling time	-0.0128	0.0034	0.0001	1.3
ab product ⁴		-0.0012	0.0007	0.0403	
<i>Number of MI sessions – Self-efficacy – TRB</i>					
TRB	Number of MI sessions	-0.8386	0.1192	<.0001	56.8
Self-efficacy ²	Number of MI sessions	0.1236	0.0365	0.0007	
TRB	Self-efficacy	-0.3984	0.0609	<.0001	32.9
	Number of MI sessions	-0.5527	0.0716	<.0001	42.5
ab product ⁴		-0.0561	0.0293	0.0278	
<i>MI counseling time – Self-efficacy – UAVI</i>					
UAVI	MI counseling time	-0.0080	0.0023	0.0005	0.8
Self-efficacy ²	MI counseling time	0.0025	0.0008	0.0015	
UAVI	Self-efficacy	-0.4940	0.0798	<.0001	39
	MI counseling time	-0.0093	0.0023	<.0001	0.9
ab product ⁴		-0.0007	0.0004	0.0505	
<i>Number of MI sessions – Self-efficacy – UAVI</i>					
UAVI	Number of MI sessions	-0.6512	0.0724	<.0001	47.9
Self-efficacy ²	Number of MI sessions	0.1236	0.0365	0.0007	
UAVI	Self-efficacy	-0.4298	0.0705	<.0001	34.9
	Number of MI sessions	-0.5867	0.0811	<.0001	44.4
ab product ⁴		-0.0363	0.0189	0.0275	
Mediation by motivation					
<i>MI counseling time – Motivation – TRB</i>					
TRB	MI counseling time	-0.0135	0.0041	0.0011	1.3
Motivation ³	MI counseling time	-0.0002	0.0003	0.5638	
TRB	Motivation	-1.4411	0.2762	<.0001	76.3
	MI counseling time	-0.0148	0.0043	0.0006	1.5
<i>Number of MI sessions – Motivation – TRB</i>					
TRB	Number of MI sessions	-0.8386	0.1192	<.0001	56.8
Motivation ³	Number of MI sessions	-0.0133	0.0125	0.2867	
TRB	Motivation	-1.3743	0.2616	<.0001	74.7
	Number of MI sessions	-0.903	0.1728	<.0001	59.5
<i>MI counseling time – Motivation – UAVI</i>					
UAVI	MI counseling time	-0.0080	0.0023	0.0005	0.8
Motivation ³	MI counseling time	-0.0002	0.0003	0.5638	
UAVI	Motivation	-1.1465	0.2110	<.0001	68.2
	MI counseling time	-0.0090	0.0023	<.0001	0.9

Number of MI sessions – Motivation – UAVI

UAVI	Number of MI sessions	-0.6512	0.0724	<.0001	47.9
Motivation ³	Number of MI sessions	-0.0133	0.0125	0.2867	
UAVI	Motivation	-0.9210	0.2328	<.0001	60.2
	Number of MI sessions	-0.6358	0.0787	<.0001	47

¹ Controlling for age, educational attainment, having a main partner, sexual identity, date of HIV diagnosis, having an undetectable HIV viral load, clinic site, counselor, proportion of counseling sessions done by telephone, history of previous enrollment in a study providing MI counseling, binge drinking in the last three months, cocaine/crack use in the last three months.

² Controlling for all variables listed in point 1 above and motivation to practice safer sex.

³ Controlling for all variables listed in point 1 above and self-efficacy to practice safer sex.

⁴ Obtained from bootstrapping of 1000 samples with replacement

CHAPTER SIX: CONCLUSION

This chapter emphasizes the significance of the dissertation, summarizes the findings according to each study aim, provides an overview of study strengths and limitations, and discusses the implications of this study for theory, research, and practice.

6.1. Significance of Dissertation

To my knowledge, this is the first study that has attempted to examine the effect of the amount of MI time on sexual behavior of PLWHA and the role that self-efficacy plays in this relationship. Exploring this relationship is important because it improves our understanding of the ways motivational interviewing works and what contributes to its effectiveness. This information is particularly useful because it has the potential to enhance the effectiveness of this increasingly used approach. Although initially designed to treat substance abuse, Motivational Interviewing is being applied more and more to a broad spectrum of health-related behaviors (Dunn, Deroo, & Rivara, 2001). The results of the existing studies suggest that MI counseling may be an effective approach for interventions that reduce risky sexual behavior for PLWHA (Naar-King et al., 2006; Parsons, Golub, Rosof, & Holder, 2007). While the optimal dose or dose at which one begins to see a point of diminishing effects is still not clear, the findings in this dissertation suggest that, at least for HIV “prevention with positives” programs, and likely in other settings as well, the overall amount of counseling time is a critical component of promoting safer sex self-efficacy and safer sexual behavior.

The fact that almost 20% of the study participants at baseline reported transmission risk behavior confirms yet again a need for further HIV prevention programs for PLWHA to address

the HIV epidemic. Although highly active antiretroviral therapy increased the lifespan for PLWHA, many public health challenges remain, including the development of drug resistant strains and lifetime costs of treating HIV/AIDS infection. Assuming that an HIV-infected individual in the United States lives approximately 24.2 years from the time one enters into medical care and has average lifetime medical costs between \$303,100 and \$618,900 (Schackman et al., 2006), 55,400 people infected annually would cost billions of dollars for each cohort of new infections (Noar, 2008). Allocating more resources to provide greater amount of MI may be justified because it is likely to reduce the number of new infections and, consequently, may decrease treatment costs.

My findings are consistent with previous research of MI in general, which has established an association between the duration of MI counseling, the number of encounters clients have with counselors, and the likelihood of achieving an effect, although mine is the first study that I am aware of to look specifically at the effects of counseling on the sexual behavior of PLWHA (Burke, Arkowitz, & Menchola, 2005; Rubak, Sandbæk, Lauritzen, & Christensen, 2005). The findings of my research not only contribute to our understanding of how best to deliver HIV counseling to PLWHA, but also add to our insight regarding how to provide optimal MI counseling in general.

My findings have critical implications because enhancing self-efficacy has been shown in multiple settings to enhance health behaviors that are linked to health outcomes (Dilorio, Dudley, Soet, Watkins, & Maibach, 2000; Parsons, Golub, Rosof, & Holder, 2007; Wolf et al., 2007). Few HIV prevention studies demonstrated an intervention having an effect via changes in self-efficacy to practice safer sex (NIMH, 2001; O'Leary, Jemmott, & Jemmott Iii, 2008). This work provides evidence to advance existing research by establishing a mediating role of self-efficacy

in a sample of HIV positive people receiving MI counseling. Specifically, I demonstrated that counseling time had its effect on sexual behavior in part via changes in self-efficacy to practice safer sex. This finding confirms the presumed importance of addressing self-efficacy in MI with PLWHA in order to make future risk reduction interventions more effective. It also strengthens the presumed theoretical underpinnings of MI in general since enhancing self-efficacy is one of the five main principles that underlie MI (Miller & Rollnick, 1991). This study confirms that targeting self-efficacy, as postulated, has the expected effect on behavior exactly via the mechanism by which we are trying to affect behavior in MI. Overall, these dissertation findings contribute to research in intervention development for PLWHA.

6.2. Findings Overview

6.2.1. Study Aim 1

The first aim of this dissertation was to analyze the degree to which time spent in counseling HIV-positive patients using MI predicts patients': a) self-efficacy for practicing safer sex; and b) motivation for practicing safer sex. I found that self-efficacy to practice safer sex for PLWHA improved the more MI counseling time and sessions they received. Thus, participants with low to moderate doses of MI counseling had on average a 0.26 higher self-efficacy to practice safer sex mean scores than participants with zero MI counseling time ($p=0.01$). On the other hand they also had a 0.26 lower self-efficacy mean scores than participants with high amounts of MI counseling time ($p=0.04$). Participants with high doses of MI counseling had, on average, a 0.5 higher mean self-efficacy score than participants with zero amount of counseling time ($p<0.0001$). Participants who received 3-4 counseling sessions had, on average, 0.41 greater self-efficacy to practice safer sex mean scores than participants who did not receive any MI sessions ($p<0.0001$), but they did not differ from participants receiving only 1 to 2 counseling

sessions. I did not establish any association between the amount of MI time and the motivation to practice safer sex. I concluded that MI time, whether measured in number of counseling sessions or minutes spent being counseled, is an important factor for enhancing safer sex self-efficacy among PLWHA.

6.2.2. Study Aim 2

The second dissertation aim was to analyze the degree to which time spent in Motivational Interviewing safer sex counseling predicts sexual risk behavior among HIV-positive patients seen in three North Carolina clinics. I found that as the amount of counseling minutes and number of provided sessions increased, the sexual risk behavior of participants decreased ($p < 0.0001$). I concluded that MI time is an important factor for enhancing safer sexual behaviors of PLWHA.

6.2.3. Study Aim 3

The third aim of this dissertation was to analyze the roles of: a) self-efficacy for practicing safer sex; b) motivation to practice safer sex as mediators in the relationship between counseling time and patients' sexual risk behavior. I found that the effect of the amount of counseling time and number of counseling sessions on sexual risk behavior was mediated in part by self-efficacy to practice safer sex. Motivation to practice safer sex did not mediate this relationship although there was a negative association between motivation to practice safer sex and risky sexual behavior. I concluded that counseling time had its effect on sexual behavior in part via changes in self-efficacy to practice safer sex.

6.3. Strengths and Limitations

There are several study strengths. Using a longitudinal design with repeated measures provides greater confidence in establishing causality compared to using data from a cross-

sectional design by offering more information about the temporality of change. It also allows us to address several alternative explanations for the effects, such as the existence of omitted variables. The changes over time occur within an individual. Therefore, every person serves as his or her own control (MacKinnon, 2008). To minimize alternative explanations even further, I included potential confounding variables.

I used count measures (i.e. absolute frequency measures) to measure sexual behavior variables because, compared to categorical measures, counts provide more informative means to estimate HIV contraction risk (Schroder, Carey, & Venable, 2003a). Also, I used a bootstrapping technique to create confidence intervals for indirect effects. This method provides good accuracy for significance tests for the mediated effect (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

My study has several limitations. Because of the sensitive and private nature of sexual health and sexual activity, the study used self-reported data from participants rather than observational data. The self-reported data are subject to social desirability and recall biases (Fisher, 1993). These biases were minimized in the study by using computer-assisted interviewing techniques (Gribble, Miller, Rogers, & Turner, 1999; Turner et al., 1998). Social desirability bias were also minimized by asking questions related to the last three month time period rather than the past month (Schroder, Carey, & Venable, 2003b). In addition, to measure self-efficacy and motivation to practice safer sex, I used scales with good validity and high reliability.

Absence of randomization to different doses of MI limits my ability to establish a causal relationship between the amount of MI received and sexual behavior. For example, it is possible that those participants who were more motivated to change their behavior received more

counseling time and attended more sessions than participants who were less motivated. In contrast, it is also possible that counselors provided more MI time to participants with a higher risk sexual behavior compared to participants with a lower sexual risk behavior. Also if the quality of counseling had been unequal across counselors, patients may have stayed longer or come back more due to receipt of better quality MI. However, my attrition analysis revealed no difference by counselor. I did find that participants' absence at the 12 months follow-up was associated with having a higher motivation to practice safer sex at baseline. Nevertheless, I was able to establish an association between the amount of counseling and the sexual risk behaviors for the sample of participants who were less motivated to practice safer sex. Also, participants may have practiced safer sex as a result of being exposed to the survey questions or because of local events (such as health promotion campaign) happening during the study period. Although only randomization to a condition may address these threats to internal validity, I minimized them by controlling for potential confounding variables in the analysis.

I analyzed the mediation effect of self-efficacy and motivation to practice safer sex because supporting self-efficacy and motivating people to change their behaviors are the two main principles underlying Motivational Interviewing counseling and two intermediate factors that counselors explicitly target to attempt to change behavior. However, there could be other mediating variables I did not measure.

Finally, threats to external validity exist in this study because the study sites were not randomly chosen for the intervention. Therefore, I should exercise caution in generalizing the study findings beyond the population of HIV-positive patients who attended the three study clinic sites or to populations similar to these participants.

6.4. Implications: Theory, Research, and Practice

Theoretical Implications

My research confirmed that self-efficacy, one of the main constructs of Social Cognitive Theory, is a key factor that needs to be modified by an intervention in order to promote healthier behaviors. The Social Cognitive Theory asserts that the behavior of an individual is influenced by a number of intra- and interpersonal factors, and that there is a dynamic interaction among a person, his or her behavior, and the environment (Bandura, 1977). The theory states that a person needs to have high confidence in his/her abilities to perform a particular behavior in order to implement the behavior. Self-efficacy refers to an individual's confidence that he/she can effectively perform a certain behavior under specified conditions (Bandura, 1977). According to the theory, people's beliefs and perceptions about their capabilities influence their behavior, the amount of effort they put into a task, their emotional response to the task as well as their motivation and ability to apply certain skills to the task. Self-efficacy plays a significant role in predicting health behavior change and maintenance (O'Leary, 1985; Strecher, DeVellis, Becker, & Rosenstock, 1986). Moreover, self-efficacy can be enhanced and, importantly, this enhancement is prospectively related to health behavior change (Strecher, DeVellis, Becker, & Rosenstock, 1986).

I have demonstrated that self-efficacy to practice safer sex for PLWHA improves as participants receive more MI counseling time and sessions. Social Cognitive Theory emphasizes the need for small, gradual steps when counseling clients to enhance their self-efficacy (Baranowski, Perry, & Parcel, 2002). My study findings suggest that spending more MI time provides clients with more opportunities to take those small steps in order to enhance self-efficacy. There are four sources of efficacy expectations: personal experience, vicarious

experience (learning from observing of events or other people), verbal persuasion, and one's physiological state (Bandura, 1977). It is likely that MI leads to increasing self-efficacy through small steps such as providing clients with opportunities for role plays, condom demonstration and practice, and relevant knowledge to enhance their personal experiences. MI also uses techniques such as reflective listening and elicit-provide-elicit to create opportunities for clients to voice their own sources of self-efficacy, thereby highlighting their personal experiences. In addition, counselors provide clients with various information related to other clients' mastery of safer sex techniques that may serve as a source of vicarious experience.

Because supporting self-efficacy is one of the main principles underlying MI counseling (Miller & Rollnick, 1991), by establishing the mediating role of self-efficacy in the relationship between MI time and sexual risk behavior, I have demonstrated empirically the theoretical importance of enhancing self-efficacy in MI for PLWHA.

I have advanced theoretical knowledge by establishing a positive association between MI time and self-efficacy to practice safer sex, and between MI time and safer sexual behaviors. Sexual behavior may be more challenging to modify than other health behaviors, because unlike other behaviors (e.g. screening, eating and physical activity, addictive behaviors) it involves another person (Johnson, Scott-Sheldon, & Carey, 2010). Interventions that provide opportunities to develop safer sex communication skills are more effective in reducing sexual risk behavior among PLWHA than interventions that do not do so (Crepaz et al., 2006). It may be that more time spent in MI by PLWHA may provide them with more opportunities to work with a counselor on developing and practicing safer sex communication strategies.

The findings in this dissertation also provide one more piece of evidence for the information-motivation-behavioral skills model (IMB) (J. D. Fisher & Fisher, 1992) by

establishing an association between motivation to practice safer sex and safer sexual behaviors. I hypothesized a positive association between the amount of motivational interviewing time and motivation to practice safer sex. However, I could not establish this association, possibly due to the fact that people with higher motivation at baseline were lost to follow-up in this study. Future studies would need to shed light on the association between the amount of motivational interviewing time and motivation to practice safer sex.

In discussing the significance of these dissertation findings it is important to acknowledge that the effectiveness of motivational interviewing is limited to primarily addressing individual level factors, like self-efficacy. The significant influence on health outcomes of higher level factors within the Social Ecological Framework, such as structural determinants of health, is increasingly recognized in public health. It is likely that behavioral interventions, like safer sex MI for PLWHA, would be increased if they were complimented by interventions that also target macro level factors, such as interventions addressing access to safe affordable housing or alternative income sources for commercial sex workers. Multiple level intervention approaches to HIV prevention are most likely to reduce HIV epidemic in the US and worldwide.

Research Implications

In this study I showed a positive association between the amount of MI counseling and safer sexual behaviors among PLWHA. I also found a positive association between the amount of MI counseling and safer sex self-efficacy. In addition, I established self-efficacy to practice safer sex as the mediator in the relationship between the amount of MI counseling and safer sexual behaviors. Future studies need to randomize participants to different dose conditions if they wish to establish a better dose-effect relationship. In addition, it would be useful to determine the minimum amount of MI counseling time necessary to produce desired changes in

safer sex behavior among PLWHA. It would also be interesting to estimate the threshold dose after which no significant behavior changes take place. Such information would enable intervention developers and health care plans to manage resources more efficiently.

We need cost-effectiveness studies to compare the relative costs and outcomes for different amounts of counseling. With current knowledge of transmission rates, cost-effectiveness analysis information would allow researchers to model change in HIV epidemic for different counseling approaches. This kind of information can inform policy decisions on resources allocation.

Finally, to gain more information about external validity, the next step would be to conduct moderation analysis. Such analysis would help identify the subgroups for which the dose-effect relationship is more apparent than for others (e.g. drug users, older clients, etc).

Practice Implications

My research suggests that MI-based prevention programs for PLWHA need to enhance self-efficacy to practice safer sex in order to ensure a behavior change, at least in populations similar to the one I studied. If clinicians and specialists developing MI interventions for PLWHA recognized the importance that the amount of time they spend with clients has on improving safer sex behavior, money and time could be saved. In an era of budgetary constraints that includes increasing pressure on clinicians and counselors to limit the time they spend with their patients, my research findings provide evidence that more time spent counseling PLWHA can have a positive impact on patient and public health outcomes.

APPENDIX 1: Motivational Interviewing and Script

SAFETALK

MOTIVATIONAL INTERVIEWING SCRIPT

Session 1

K. Paulovits, C. Golin

Materials/Forms Needed:

- Motivational interviewing (MI) **data recording sheet** = to be used to guide MI session & after the client has left to document client responses.
- Visual of **“menu of topics”**
- Visual of “Things that make me tick”
- Tape recorder = to tape MI session for quality assurance
- Audio Tape
- Materials and fact sheets on proper barrier methods, disclosure, and sexually transmitted infections.
- **CD Player headphones, first booklet, and “did you know?” booklet**

** Find a private room to conduct session*

STEP ONE: INTRODUCTION
(Tracks 1-3) (booklet pg. 4-7)

Thank you for coming in today. It's nice to see you again. How are you doing today?

Response and Reflection

You may be wondering what these sessions are all about and how these sessions will differ from the CD and booklet you received. I would be happy to talk with you about that but before I do, are there any questions or thoughts you have about our meeting today?

Response and Reflection

Well, before we get started I would like to let you know about a few things.

These sessions are part of a program to help people living with HIV deal with issues that have to do with sex or intimate relationships. Many doctors, nurses and counselors sometimes refer to these issues as "Prevention issues," because having safer sex is one way that we can prevent HIV from being transmitted from person to person. . Maybe you have heard about this.....

Response and Reflection

The most important thing for you to know before we start is: This is a time for you to explore any concerns that you have related to safe sex or intimate relationships. WE UNDERSTAND FROM WORKING WITH FOLKS LIVING WITH HIV THAT IT IS POSSIBLE TO HAVE A HEALTHY SEX LIFE AND BE POSITIVE AND STILL BE SAFE BUT WE ALSO KNOW THAT IT IS NOT ALWAYS EASY. What makes it difficult is going to be very different for each person. Only you know what would be most useful to you or what things you would like to focus on.

The four sessions that we will have together are a time for us to talk together about how or if what you heard on the CD and saw in the booklet relates to your life. So the purpose of the booklet and CD were just to get you thinking about what kinds of things are on your mind that are related to safe sex. We also gave you a second CD and booklet set that had information about safe sex that you could choose to listen to if there were things you wanted to seek information on. Our time together will be spent exploring the thoughts that came up for you while reading the booklets and/or listening to the CDs.

STEP TWO: DISCUSSING WHAT MAKES ME TICK.

(Track 4 pg. 8)

Being Healthy	Being a kind person	Not giving up
Helping people	Living life to the fullest	Being Close to God
Having sex	Being independent	My Children
Being happy	Being there for my family	My pets
Not being lonely	Having fun	Having good friends
Getting High	Trying my best	Something else.....

I would like to learn about the things in life that matter to you.

Do you remember that list of things in your booklet that describes different things that matter to people? Discussing these important things will help me know you and understand your life better. It will also help me to know what you think about when making decisions.

Of these choices, what are things you think about when you are making important decisions? Do you mind sharing them with me?

Response and Reflection

What about the category “something else...” Is there anything else that you think about when you are making a big decision?

Response and Reflection

STEP THREE: EXPLORATION OF CHOICES AND VALUES

Track 4 pg.9

So you mentioned that _____, _____ and _____ are things that come to mind when making a big decision. I would like to know more about how that works for you.

Tell me about _____ (counselor picks one of patients choices).

Response and Reflection

STEP FOUR: RISK ASSESSMENT

Track 5 pgs. 10-11

I'm wondering how the things that matter to you effect the decisions you make about safer sex?

Response

Reflection: Now I feel that I have an idea of what matters to you and how that affects the decisions you make. I would next like to ask about what is going on in your life right now in terms of sexual relationships. By sexual relationships I mean people you have sex with (anal oral vaginal), either now, in the past or in the future.

.

Assess Sexual Behavior

Sexual Behavior:

"How have things been for you in terms of relationships or dating lately, say in the last 3 months or so?"

"Tell me a little about yourself? Are you in a relationship right now?"

"What concerns do you have about your own current, past or future sexual behaviors?"

"Have you been in any sexual or intimate relationships in the last 3 months?"

Sexual Risk-Taking:

Barrier Experience: "A lot of people find it hard to imagine condoms really enhancing their sexual experiences. Can you tell me what your experiences have been with condoms, lubricants or other barriers?"

Concomitant drug use: "We've found that for some people when they are a little high, it is harder for them to follow safer sex guidelines. It would help me if you could tell me about your own use of substances for fun, especially about whether you drink or use when you have sex."

Disclosure: "Are you able to talk with your partner about your concerns regarding HIV?"

Explore Specific Behaviors:

How many partners in the last 3 months?

Men or Women or both?

Casual or Main?

Do you engage in oral, anal, vaginal intercourse with your partners?

With or without condoms? / How often, if at all, do you use condoms?

Receptive or Insertive (if applicable)?

Do you know each others' HIV statuses? Do you know your partners' HIV status? Do they know yours?

Responses

Reflection and summarization.

STEP FIVE: TOPIC SELECTION

Track 6 pg.12

Ok, now I have a better idea about what's going on in your life in regards to relationships and you have shared how the things that matter to you affect how you make decisions regarding safer sex.

Check-In: If it is ok with you, what I would like to do now is have a discussion about the list of different safer sex topics that were listed in your booklet.

Response Regarding Permission

Great, I know this can be a sensitive topic for folks, I appreciate you sharing your thoughts about these topics with me.

What if any topics on the list did you find to be important for you?

MENU OF TOPIC CHOICES

* Telling someone I am positive	How to be safer during sex
Talking about sex with partners	Using condoms
*Risks with oral sex	Having an STD
Worries I have about infecting others	Being High and having sex Having sex with someone who is HIV positive Feeling afraid of my partner
Talking to my children about being positive	Something else

**Clients are given the option to pick a prevention topic that is relevant to their lives.*

Acknowledge effort and thank.

STEP SIX: ASSESS AND REFLECT

Track 6 pg. 12

“So it sounds like _____ is something that you would really like to talk about today. I would like to understand a little more what _____ means to you and why it is an important issue for you. Please tell me more about that.”

Response and Reflection

How did it happen that

. . . Talking about sex with partners

. . . Telling someone you are positive

. . . .Using condoms

. . . . Being high and having sex

. . . . Oral sex

. . . Sex with HIV+ partner

...Having an STD

Feeling afraid of a partner

...Worries about giving someone else HIV

Is on your mind right now? Tell me about that.

Response and Explore.

Desirable activities.

I hear that this is important to you... is it perfect? Is there anything you don't like?

Undesirable activities/events.

I hear your distress. What would changing things look like, so you can prevent (fear, worry or infection) from

catching an STD

.... A relationship with someone who makes you afraid,

.... Some worries about infecting someone else?

STEP SEVEN: RATE IMPORTANCE
(Track 7 pg. 13):

“Tell me, how do you feel, AT THIS MOMENT, about [changing this behavior]?”

Response.

How important is it to you personally to change AT THIS POINT? If “0” was “not at all important” and “10” was “very important”, what number would you give to the importance you put RIGHT NOW on [changing this behavior]?

1 2 3 4 5 6 7 8 9 10

Question Down: “Why an 8 and not a 1?”

Response and Reflection

Repeat as needed to clarify change in patients mind.

Summarize change.

STEP EIGHT : RATE CONFIDENCE

Track 7 pg. 12

Ok, let me switch gears for a minute if that's ok with you. Say that today you decided that you were going to [START / CONTINUE / MAINTAIN]_____, how easy or hard would this be?

Response and Reflection

How confident are you using that same scale where 0 is no confidence and 10 is very confident that you could make this change happen?

1 2 3 4 5 6 7 8 9 10

Question Down: "Why an 8 and not a 1?"

Response and Reflection

Repeat as needed to clarify confidence in patients mind.

So, while there are some things about this that you might like to change, and you think it is important to change but you have some hesitation because of _____.

If you made a plan to deal with that problem, what would the plan be?

Response and Reflection

Repeat as needed to clarify change in patients mind.

Summarize plan.

STEP NINE: EXPLORE GOAL SETTING

Track 8 pgs. 14-15

From what I hear you saying today you think topic _____ is important
This (topic) has some things that work for you, for example _____.
You are not comfortable with some things for example, you mentioned, _____.
You rated changing these things as _____ importance and you have _____ confidence in doing so. (*don't use the scale numbers but a positive comment about importance and confidence; unless very low*).

Ready= Moderate/High in Importance and Confidence

It sounds like you may be ready to think about trying to take some / a small step(s) toward [changing this behavior] at this time. Is that right?

Response and Reflection

If needed, include referral completion as the first step in the goal.

STEP TEN: DECISIONAL MATRIX

Track 9 pg. 16-17

Sometimes when people are thinking about changing the way they do things it can be helpful to look at the behavior you are thinking about changing in different ways. If you would like, we could do that together.

Elicit Permission for Directive Role

Exploring concerns and feelings about behaviors.

Now , we have spent some time talking about _____. How are you thinking about it?

What concerns do you have about (continuing current behavior)?

How do you feel about (continuing current behavior)?

Tell me a little bit about how you feel about (continuing / changing current behavior)?

What are the main reasons you see for making this change?

Exploring pros and cons.

One thing that some people find helpful is to look at the same thing from different ways.

I'd like to ask you some questions to help you do that if that's okay. Would you like to spend a few minutes looking at what you do and don't like about [current behavior]?

First, can you tell me what you like about / what are some of the good things about your [current behavior]?

Response and Reflect

Second, can you tell me what you don't like about / what are some of the not so good things about your [current behavior], if anything?

Reflect and Provide short double sided summary

Third, can you tell me what things you might like about / you think might be good if you were to change this [current behavior]?

Response and Reflect

Finally, can you tell me what things you might not like about it / you think might not be so good if you were to change this [current behavior]?

What would you be giving up if you gave up [this current behavior]?

What would you be gaining if you gave up [this current behavior]?

a. "In what ways? How much? When? In what situations?"

b. "Can you give a specific example?"

c. "How about last time you tried this/this occurred?"

Summarizing.

Anything else that enters your mind when thinking about making these changes?

Response and Reflection

Where does this leave you now?" (Said in a neutral way).

Response and Reflection

Provide longer double-sided summary.

Affirm.

STEP ELEVEN: Making Plans

You have talked about thinking about changing X and you have talked about some of the things that make X easy, some that make it hard, some of the good things about changing and some of reasons why changing X may not be something you want. You have named a number of ways that you might do X, what specific things do you feel ready to try between now and when we meet again?

Not Ready= Low Importance and Confidence:

Sounds like you are not ready to change this.

What would it take to get ready?

If someone wanted to change how would they go about?

Even if you are not ready to change this part of your life,
is there something you would like to do differently
between now and our next visit?

You have mentioned X, Y and Z as things that might help you to make X change in your life right now that you might like to try. Which of these would you like to try to do before your next visit next month?

Elicit—Provide – Elicit

1. Elicit: Tell me what you know about these choices?

2. Reflect: on patients responses.

2. Provide: more information including referral information (*neutral presentation*).

3. Elicit: reaction to the information:

- a. What are your thoughts about this information?
- b. How does this information sit with you?
- c. How does that sound to you?
- d. How does this mesh with your own situation?
- e. Where does this leave you?

Would you like to hear about some things that others have found helpful?

STEP 12: CLOSURE

Summarize:

Review session.

Check-In:

Did I miss anything?

Is there anything you would like to add?

Do you have any questions?

Prepare for next visit.

Make appointment for next visit.

Give CD/Booklet for next visit.

APPENDIX 2: Participants Recruitment Script



SafeTalk Study Clinic Screening Script

<<this script is meant to be used as a guide for screening patients—it is not meant to be read verbatim>>

APPROACHING THE PATIENT

Say, ‘Hello Mr./Ms._____. My name is _____, and I am with the SafeTalk program here at <<Wake/UNC/Lincoln>>. You might be eligible for our study. SafeTalk is a new program for patients at Wake County Health Department, Lincoln Early Intervention Clinic, and UNC hospitals, and we are looking for people to help us see if this program is going well. Your thoughts on this program really matter to us. Would you be interested in finding out more about the study?’

If YES, continue to ‘Description of study’ either in lobby (do not reference HIV) or escort patient into a private room and include mention of HIV.

If the **patient is interested, but wants to receive information later**, tell the patient where to find you and leave an appointment card with the patient. Let the front desk know that you need to talk with the patient before s/he leaves.

If No, document the following on the screening eligibility form and database: why decline to participate, age, gender, and ethnicity. (Check Webcis by end of day to find this information.) Say, ‘That’s fine, thank you for your time. Would you be interested in talking to us about the study the next time you’re in the clinic?’

If No, write an ‘N’ in the ‘approach’ column of the screening eligibility form and record in database.

If Yes, write a ‘Y’ in the ‘approach’ column of the screening eligibility form and record in database.

DESCRIPTION OF STUDY

‘Your role in the study would be to do **4 surveys, each 4 months apart, one of which you can do today if you have time**. You’ll get a **\$25 gift card** each time you come in to do a survey, and

if you have time to do the first survey today you can get the first \$25 certificate. We are doing these **surveys using a computer**. So, if you decided this was something you'd like to do, you would come in and sit in front of a **computer and answer some questions**. We can help you with the computer as you need it.

You will also have the **opportunity to meet with a professional counselor 4 times during the study. You'll get a \$15 gift card each time you come to see the counselor, and you can get vouchers if you need them** <<for parking and food if at UNC / for bus and food if at Wake / for bus if at Lincoln>>. We will do our best to **line up as many of these appointments with your clinic visits** as possible.

The reason we are doing this study is that we are trying to see whether a new counseling program can help give better care to people [with HIV (*only say in private room*)]. We're really **interested in hearing what you have to say**.

If you're interested, I can ask you a couple of questions to see if you're eligible.'

If Yes, continue. If in clinic lobby, move to a private room at this point

If No, document the following on the screening eligibility form and database: why decline to participate, age, gender, and ethnicity. (Check Webcis by end of day to find this information.) Say, 'That's fine, thank you for your time. Would you be interested in talking to us about the study the next time you're in the clinic?'

If No, write an 'N' in the 'approach' column of the screening eligibility form and record in database.

If Yes, write a 'Y' in the 'approach' column of the screening eligibility form and record in database.

FINAL SCREENING (conducted in private room)

'I have just a couple more questions to ask you to see if you qualify for the study.'

- a. Is today your **first visit to this clinic**?
- b. Do you have definite **plans to leave the clinic** during the next 12 months?
- c. Do you attend the Wake HIV clinic? [If patient says "yes" or is unsure, check the name and date of birth against the SafeTalk database to make sure patient is not enrolled at the Wake site. If patient is enrolled at Wake site, explain this to the patient and stop here.]

Now , I have one sensitive question that I ask of everybody who screens for this study.

- d. **Have you had sex** in the last 12 months? By sex, I mean oral, vaginal, OR anal sex.

If the patient says "Yes" to "a" OR "Yes" to "b", OR "No" to "d", s/he is **ineligible**.

If the patient says "No" to "a" AND "No" to "b" AND "Yes" to "d", check the STAR study register to determine whether s/he is currently enrolled in STAR or has had STAR MI in the past 6 months.

If no STAR participation/MI, s/he is **eligible**.

If currently enrolled in STAR or received STAR MI in the past 6 months, s/he is **ineligible**.

If patient is ineligible:

‘Based on your answers to those questions **you are not eligible for this study**. Thank you for your time. Would you be interested in talking to us again the next time you’re in the clinic to see if you’re eligible then?’

If No, write an ‘N’ in the ‘approach’ column of the screening eligibility form and record in the SafeTalk database. Also document the following: why decline to participate, age, gender, and ethnicity. Check Webcis by end of day to find this information.

If Yes, write a ‘Y’ in the ‘approach’ column of the screening eligibility form and record in the SafeTalk database. Also document the following: why decline to participate, age, gender, and ethnicity. Check Webcis by end of day to find this information.

If patient is eligible:

‘Based on your answers to those questions **you are eligible to participate in this study**. Would you like to enroll **and** complete your first survey today?’

If Yes, administer the study and HIPAA ICFs.

If No, document the following on the screening eligibility form and database: why decline to participate, age, gender, and ethnicity. (Check Webcis by end of day to find this information.) Ask patient, ‘Would you be interested in talking to us again about the study the next time you’re in the clinic to see if you’re interested then?’

If No, write an ‘N’ in the ‘approach’ column of the screening eligibility form and record in database.

If Yes, write a ‘Y’ in the ‘approach’ column of the screening eligibility form and record in database.

If the patient would like to enroll but **cannot complete the first survey today**, tell the patient:

‘You can enroll the next time you are at the clinic and have time to do the survey, which takes 45 minutes to an hour.’ Offer to give the patient a study flier to take home.

INFORMED CONSENT-STUDY

‘Thank you for your time and interest in this study. Now I **need to get your consent** to participate in the study. Would you like to read this consent form on your own, or would you like me to read it out loud?’

The study and HIPAA ICFs will either be read out loud by the RA or read by the patient.

ASSESSMENT OF UNDERSTANDING –STUDY ICF

After the consent form has been read, say:

‘Just to make sure you’re comfortable with this information, I’ll review some of the main points with you.’

This study will last 1 year, and you’ll come in for 7 visits total. So what that means, is that **today** you will be completing a survey on a computer that will take about 45-60 minutes to complete. Then you will have to come to the clinic [Wake or UNC or Lincoln] **4 more times** to the clinic to meet with a counselor, which will take about 30-45 minutes each time. In addition,

there will be three more visits where you'll have to fill out a survey on a computer just like today—that takes about 45-60 minutes. There may be one visit where you might have to see your counselor AND fill out the survey, so that you don't have to come back a separate time. Again, that is a total of 7 visits.

You'll be participating in counseling on either safer sex or heart-healthy topics. Which one you take part in depends on chance—you have a one out of two chance, or 50:50, like flipping a coin, of being in the safer sex program.

In either counseling program you'll get a portable CD player and some CDs to listen to so you can prepare for your counseling sessions, and you'll also get some reading materials. Each time you do the computer survey you'll get a \$25 gift card, and each time you come for counseling you'll get a \$15 gift card, and you can get vouchers if you need them <<*for parking and food if at UNC / for bus and food if at Wake / for bus if at Lincoln*>>.

Also, if you are on medications for your HIV, we will be asking you some questions about your medicines at each visit, and we'll also ask you to bring your medicines to every visit so that we can count your pills. <<*At UNC only*>> If you're on certain anti-HIV pills, we may give you an electronic pill bottle cap to keep track of when you open and close your bottle. '

'What questions do you have about the study?' Talk with the patient to answer questions and assess his/her understanding of the study. Ask the patient to describe what s/he understands about the study, and use this opportunity to answer questions and clarify confusing parts of the ICF. If you are unsure of the patient's understanding of the study, you can ask the following questions:

Do you understand that once you complete the first survey you will need to come to the clinic at least six more times during the year (not including this visit) to do counseling and the computer survey? Y N

Do you understand that by enrolling in this study you are giving people working on the study permission to use information from your medical records, including lab results and other clinical data, for research purposes? Again, no identifying information, such as your name or medical record number, will be linked to the data that is collected. Y N

Do you understand that you will receive a \$25 gift card today for each time you do a computer survey, and \$15 for each counseling session, for a total of \$160 in gift cards? Y N

Do you understand that if you're on anti-HIV medicines, we will ask you to bring your anti-HIV pills to your study visits so that we can count the pills?

<<*At UNC only*>> Do you understand that if you're on certain anti-HIV pills, we may give you an electronic pill bottle cap to record when you open and close your bottle?

Do you understand that this study is completely voluntary? Y N

NOTE: If a patient answers no to any of the above questions, please review and clarify the ICF content.

'Thank you for taking the time to read <<OR listen to>> this form. If you are still interested in participating in the study at this point, please sign and date the form.'

If the participant signs the form, sign the form as a witness. Proceed to administer the HIPAA ICF.

If the participant refuses to participate, say ‘That’s fine, thank you for your time. Would you be interested in talking to us again about the study the next time you’re in the clinic?’

If No, write an ‘N’ in the ‘approach’ column of the screening eligibility form and record in the SafeTalk database. Also document the following: why decline to participate, age, gender, and ethnicity. Check Webcis by end of day to find this information.

If Yes, write a ‘Y’ in the ‘approach’ column of the screening eligibility form and record in the SafeTalk database. Also document the following: why decline to participate, age, gender, and ethnicity. Check Webcis by end of day to find this information.

INFORMED CONSENT—HIPAA

Say, ‘Now we need to review another informed consent form. The HIPAA is a new ICF that is now required for all study participants. Would you like to read this HIPAA consent form on your own, or would you like me to read it out loud?’

HIPAA ICF will either be read out loud by the RA or read by the patient.

ASSESSMENT OF UNDERSTANDING –STUDY ICF

After the HIPAA consent form has been read, say:

‘What questions do you have about this form?’ Talk with the patient to answer questions and assess his/her understanding of the HIPAA ICF. Ask the patient to describe what s/he understands about the form, and use this opportunity to answer questions and clarify confusing parts of the HIPAA ICF. If you are unsure of the patient’s understanding, you can ask the following questions:

Optional- ASSESSMENT OF UNDERSTANDING---HIPAA ICF

Do you understand that by signing this form you are giving people working on the study permission to use the health information you provide to us, including information that is in medical charts, for research purposes?’

NOTE: If a patient answers no to any of the above questions, please review and clarify the HIPAA ICF content.

Then the participant will read, sign, and date the HIPAA ICF. Sign and date the HIPAA ICF as a witness.

ENROLLMENT

IF PATIENT ENROLLS:

GIVE THE PATIENT A COPY OF THE ICF

Say, ‘Thank you for participating in our study.’

Check off both study and HIPAA ICFs on “document completion form.” PLACE ICFS IN LOCKED FILE CABINET.

TAKE NEXT CONSECUTIVE **YELLOW** COLORED FILE FOLDER.

ALSO TAKE ONE HONORARIUM. RECORD THE SERIAL NUMBER ON THE HONORARIUM RECEIPT AND IN THE SAFETALK DATABASE.

COMPLETE CONTACT UPDATE FORM

Say, 'Now I'm going to take a few minutes to get some contact information from you. I want to assure you that all of this information will remain confidential and will only be used to remind you of your study appointments, either by mail or phone if you give us permission to contact you this way.'

COMPLETE ADHERENCE ELIGIBILITY SCREENING FORM

Say, 'Now I'm going to ask you some questions about what medicines you are on.'

Complete adherence eligibility screening form.

If the participant is eligible for pill count, say: 'When you come to see the counselor for the first time, please bring all of your anti-HIV medicines with you. We will be counting your pills.'

If the participant is eligible for electronic pill cap, say: 'We'll also be giving you a special electronic cap for one of your pill bottles that will record each time you take your medicine.'

COMPLETE ADHERENCE SURVEY (only with participants on anti-HIV medicines)

Say, 'Next I'll ask you some questions about each HIV medicine that you take.'

BASELINE ACASI ADMINISTRATION

'The next thing I need you to do is complete a questionnaire on the computer. The survey will take about 45 minutes to one hour.'

SET UP ACASI, SHOW PARTICIPANT HOW TO USE THE ACASI

'Are you comfortable using a computer and mouse?'

'There will be a quick program on the computer that asks sample questions to help you feel more comfortable on the computer, but I would also be happy to help you operate the mouse and mark answers.'

PROCEED AS INDICATED BY PARTICIPANT'S EASE OF COMPUTER USE

If participant expresses any hesitancy or concern, say:

'There will be a quick program on the computer that asks sample questions to help you feel more comfortable on the computer, and I would also be happy to help you operate the mouse and mark answers. I could also show you how to use the computer and then stand right outside the room in case you need help.'

If RA leaves the room, say:

'I'll stop by in a few minutes to check in on you. If you have any questions or if you finish and I'm not in the room, I'll be right outside the room. Please feel free to come get me.'

WHEN THE PARTICIPANT FINISHES, PRINT AND REVIEW ACASI

GIVE PARTICIPANT THE \$25 GIFT CARD. MAKE SURE S/HE INITIALS RECIEPT.

'Thank you again for your time and participation in this study. Can we schedule a time for your next visit?'

APPENDIX 3: SAFETALK ACASI Survey

Patient Assessment (English)

The date is recorded as [DATE] and the time is recorded as [STTIME]. If these are incorrect, please exit and correct system clock.

BAQ1. Patient ID Number: _____

BAQ2. Site ID: _____

If Q2 is not equal to PAID2 then Site ID does not correspond with first two digits of Patient ID. Please correct." skip to BAQ1.

BAQ3. Visit Number: ____

BAQ4. RA Initials: ____

The ID is recorded as [Response to BAQ1]. Site is recorded as [Response to BAQ2] and visit is recorded as [Response to BAQ3]. If these are incorrect, please go back and correct.

HISTORY QS.

Ever on ART

BAQ5. Have you **ever** taken HIV medications to treat your HIV-infection?

- | | |
|---|------------------|
| 1 | Yes |
| 0 | No |
| 7 | Don't Know |
| 8 | Refuse to Answer |

If BAQ5 is equal to 0, then skip to BS1Q1.

Currently on ART

BAQ6. Are you **currently** taking HIV medications to treat your HIV-infection?

- | | |
|---|------------------|
| 1 | Yes |
| 0 | No |
| 7 | Don't Know |
| 8 | Refuse to Answer |

If BAQ6 is equal to zero, skip to BS1Q1.

[INTER: Enter HIV medicines into column headings on next page using Card A and prior interview.

[INTER: Proceed to BAQ7 on GRID on next page]

Thank you for agreeing to participate in our study today. The purpose of this study is to help us develop programs for people living with HIV to help them stay healthy. The information we gather will help us learn how different health programs affect what people living with HIV think and believe about their health.

This survey contains questions about sensitive topics such as drug and alcohol use, and sexual behavior. Everything you say will be kept private and confidential. We do not share your individual answers with any doctors or nurses in the clinic. We will combine what you tell us with everyone else's answers to the same questions and remove all names for reports.

Because many men and women are participating, some questions in this interview may not apply to you; however, we have to ask the same questions of all participants. All the information you can provide is important and will be helpful, but we don't want you to feel uncomfortable. Feel free to skip any questions that you do not feel comfortable answering, or when the question doesn't apply to you, if that's the case. When you answer, please answer as honestly as possible. There are no right or wrong answers. We want to get a true picture of what you and everyone else who answers these questions thinks or feels. We appreciate your helping us today, as well as your important contribution to HIV prevention research. This interview will take about 45-50 minutes to complete. Do you have any questions for me before we get started?

[Tutorial here—make it optional]

1. HIV History and Current Medical Status

We will start by asking you some questions about your health and medical care.

GLOBAL HEALTH

BS1Q1. In general, would you say your health is: (Select one)

- | | |
|---|------------------|
| 1 | Poor |
| 2 | Fair |
| 3 | Good |
| 4 | Very Good |
| 5 | Excellent |
| 8 | Refuse to Answer |

CLINICAL QUESTIONS.

BS1Q2. We are doing this study with people who are living with HIV. It is helpful for us to know how long you have been personally dealing with HIV. What month and year did you first learn that you were HIV-positive? *[The HIV antibody test was first given in 1985.]*

___ / ___ mm / yyyy

BS1Q2a. Have you had a viral load test in the past 6 months?

- | | |
|---|---------------------------------|
| 1 | Yes |
| 0 | No->SKIP TO BS1Q3 |
| 7 | Don't Know->SKIP TO BS1Q3 |
| 8 | Refuse to Answer->SKIP TO BS1Q3 |

BS1Q2b. At that time, were you undetectable?

- | | |
|---|------------------|
| 1 | Yes |
| 0 | No |
| 7 | Don't Know |
| 8 | Refuse to Answer |

BS1Q3. Do you have an HIV case manager at this clinic or at any other location (someone who helps with getting medical and social support services)?

- | | |
|---|------------------|
| 1 | Yes |
| 0 | No |
| 7 | Don't Know |
| 8 | Refuse to Answer |

Patient/Provider Communication

BS1Q4. During your office visits, how much do you and your healthcare provider usually talk about HIV prevention issues like safer sex and drug use? Would you say that you talk about HIV prevention issues:

- | | |
|---|--|
| 1 | A lot |
| 2 | Somewhat |
| 3 | A little |
| 4 | You do not really talk about them at all |
| 8 | Refuse to Answer |

II. Beliefs/Attitudes toward Safer Sex and Nutrition

Now, we will ask some questions about what **YOU** believe about your health. Some of the questions are about eating habits and some are about safer sex. Each of the following questions is asking about your habits in the **last month (30 days)**. For each one, pick the response that matches best for you.

BS2Q1. In the **last month (30 days)**, about how many servings of fresh fruits or vegetables did you eat **each day**?

- | | |
|---|--------------------|
| 1 | 5 or more servings |
| 2 | 3-4 servings |
| 3 | 2 or less servings |

BS2Q2. In the **last month (30 days)**, how many non-diet sodas or glasses of sweetened tea did you drink **each day**?

- | | |
|---|-------------------|
| 1 | 3 or more a day |
| 2 | 1-2 a day |
| 3 | Less than 1 a day |

BS2Q3. In the **last month (30 days)**, how much margarine, butter, or meat fat did you use to season vegetables or put on potatoes, bread, corn or other foods **each day**?

- | | |
|---|---------------|
| 1 | A fair amount |
| 2 | Some |
| 3 | Very little |

BS2Q4. In the **last month (30 days)**, **how many times a week** did you eat fast food?

- | | |
|---|------------------------|
| 1 | 4 or more times a week |
| 2 | 1-3 times a week |
| 3 | Less than once a week |

BS2Q5. In the **last month (30 days)** **how many times a week** did you eat chicken, or fish, or beans (like pinto or black beans)?

- | | |
|---|------------------------|
| 1 | 3 or more times a week |
| 2 | 1-2 times a week |
| 3 | Less than once a week |

BS2Q6. In the **last month (30 days)**, **how many times a week** did you eat snack chips or crackers (not the low-fat)?

- | | |
|---|------------------------|
| 1 | 4 or more times a week |
| 2 | 1-3 times a week |
| 3 | Less than once a week |

BS2Q7. In the **last month (30 days)**, **how many times a week** did you eat desserts OR other sweets?

- | | |
|---|------------------------|
| 1 | 4 or more times a week |
| 2 | 1-3 times a week |
| 3 | Less than once a week |

Now, the next question is about what you believe your chances are of getting or giving a sexually transmitted disease or STD.

Likelihood of infecting others

STEP (Thomas/Earp)

BS2Q8. If you had sex with someone just one time, it would be pretty hard to catch a STD from that person. Do you:

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot

The next questions are about the chances of passing HIV to others. The first few questions are about the possibility of giving HIV to someone who is HIV negative. After that, we'll ask you about transmitting to people who are HIV positive. After hearing each statement, pick the answer that best matches what you believe.

Seriousness of transmission risk

Elford (revised)

BS2Q9. New HIV medications make giving someone HIV:

- 1 Much less serious than it used to be
- 2 A little less serious than it used to be
- 3 About as serious as it used to be
- 4 A little more serious than it used to be
- 5 Much more serious than it used to be
- 7 Don't Know
- 8 Refused to Answer

Belief about condom efficacy

(spns)

BS2Q10. Using condoms correctly is:

- 1 A completely effective way to keep you from giving HIV to someone else
- 2 A very effective way to keep you from giving HIV to someone else
- 3 A somewhat effective way to keep you from giving HIV to someone else
- 4 Not a very effective way to keep you from giving HIV to someone else
- 5 Not at all an effective way to keep you from giving HIV to someone else
- 7 Don't Know
- 8 Refused to Answer

Worry

BS2Q11. How worried are you that you gave HIV to someone else in the last six months? Would you say that you are:

- 1 Very worried that you gave HIV to someone else

- 2 Somewhat worried that you gave HIV to someone else
- 3 A little bit worried that you gave HIV to someone else
- 4 Not worried at all that you gave HIV to someone else
- 7 Don't Know
- 8 Refuse to Answer

TRANSMISSION RISK—Perceived Risk with Different Viral Loads
Kalichman “In the Mix”

The next three questions ask you about your likelihood of giving HIV to someone. (Have narrator's inflection change when saying the level of viral load)

BS2Q12. Imagine you had unprotected sex one time today with an HIV negative partner. What's the chance that you would give HIV to that partner given your current viral load?

- 1 High
- 2 Medium
- 3 Low
- 4 No chance
- 7 Don't Know
- 8 Refused to Answer

BS2Q13. Now imagine that your viral load is undetectable. Now, what's the chance you would give HIV to a HIV negative partner if you had unprotected sex one time today?

- 1 High
- 2 Medium
- 3 Low
- 4 No chance
- 7 Don't Know
- 8 Refused to Answer

BS2Q14. Now imagine the other extreme. Imagine your viral load is high (over 100,000). What's the chance you would give HIV to a HIV negative partner if you had unprotected sex one time today?

- 1 High
- 2 Medium
- 3 Low
- 4 No chance
- 7 Don't Know
- 8 Refused to Answer

Transmission Risk—Perceived Risk of reinfection
(Colfax, 2004)

Now let's talk about reinfection. Reinfection is when a person who has one strain of HIV becomes infected with a different strain of the virus. Some people call this superinfection.

BS2Q15. Have you ever heard of HIV reinfection or superinfection?

- 1 Yes
- 0 No

For the next two questions, give the answer that comes closest to how you feel. What we'd like is your first reaction, your "gut reaction."

BS2Q16. Given your current sexual behaviors, how likely do you think you are to be reinfected with another strain of HIV in the next year?

- 1 Very likely
- 2 Somewhat likely
- 3 A little likely
- 4 Not at all likely
- 7 Don't Know
- 8 Refused to Answer

BS2Q17. Getting reinfected with HIV could really harm my health. Do you?

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 8 Refused to Answer

ATTITUDES TOWARD CONDOMS

STEP (THOMAS/EARP)

Now I am going to read you some things people think about sex and sexually transmitted diseases (STDs). For each one, tell me whether you agree or disagree with it by clicking on the answer that best fits with what you believe.

BS2Q18. Just about any kind of sex feels better when you don't use a condom. Do you:

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

BS2Q19. Having to stop sex to put on a condom takes the fun out of it. Do you:

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

BS2Q20. Using a condom during sex is like telling others that you might have an STD or HIV. Do you:

- 1 Agree A Lot

- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

Golin (de novo)

BS2Q21. Using a condom during sex feels uncomfortable. Do you:

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

Golin (de novo)

BS2Q22. Using a condom during sex is embarrassing. Do you:

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

Satisfaction with Sex Life

BS2Q23. Think about your sex life. In the past 6 months, would you say you have been:

- 1 Very satisfied with your sex life
- 2 Somewhat satisfied with your sex life
- 3 Not very satisfied with your sex life
- 4 Not satisfied at all with your sex life
- 7 Don't Know
- 8 Refused to Answer
- 9 Not Applicable

III. MOTIVATION and INTENTIONS TO AVOID UNSAFE SEX

Roffman's "The Sex Check" study (modified)

The next questions are about how you feel about having sex in the next 3 months with a main partner. By sex, we mean anal (in the butt) or vaginal sex. A main partner would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

BS3Q1. In the next three months, how motivated or unmotivated do you feel about having safer sex. Do you feel:

- 1 Not at all motivated
- 2 Somewhat motivated
- 3 Very motivated
- 4 Totally motivated
- 8 Refused to Answer

9 Not Applicable

Golin (de novo adapted from PACT adherence motivation question)

BS3Q2. In the next three months, how important or unimportant will it be to you to use a condom every single time you have sex? Would you say that for you it is:

- | | |
|---|--|
| 1 | Not at all important to use a condom every single time |
| 2 | Somewhat important to use a condom every single time |
| 3 | Very important to use a condom every single time |
| 4 | Extremely important to use a condom every single time |
| 8 | Refused to Answer |
| 9 | Not Applicable |

BS3Q3. In the next three months, how important or unimportant is it to you to tell any **new** partner that you have HIV? Would you say it is:

- | | |
|---|----------------------|
| 1 | Not at all important |
| 2 | Somewhat important |
| 3 | Very important |
| 4 | Extremely important |
| 8 | Refused to Answer |
| 9 | Not Applicable |

The next questions are about how you feel about having sex in the next 3 months with a **casual partner**. (by sex, we mean anal or vaginal sex) A “casual partner” would be anyone you don’t consider a main partner?

BS3Q4. In the next three months, how motivated or unmotivated do you feel about having safer sex with a casual partner. Do you feel:

- | | |
|---|----------------------|
| 1 | Not at all motivated |
| 2 | Somewhat motivated |
| 3 | Very motivated |
| 4 | Totally motivated |
| 8 | Refused to Answer |
| 9 | Not Applicable |

Golin (de novo adapted from PACT adherence motivation question)

BS3Q5. In the next three months, how important or unimportant will it be to you to use a condom every single time you have sex? Would you say that for you it is:

- | | |
|---|--|
| 1 | Not at all important to use a condom every single time |
| 2 | Somewhat important to use a condom every single time |
| 3 | Very important to use a condom every single time |
| 4 | Extremely important to use a condom every single time |
| 8 | Refused to Answer |
| 9 | Not Applicable |

BS3Q6. In the next three months, how important or unimportant is it to you to tell any new partner that you have HIV? Would you say it is:

- | | |
|---|----------------------|
| 1 | Not at all important |
| 2 | Somewhat important |
| 3 | Very important |
| 4 | Extremely important |
| 8 | Refused to Answer |
| 9 | Not Applicable |

Roger Roffman's Intentions Scale ("The Sex Check" Study)

We know that many people do not practice safer sex every time they have sex. (Pause)

For the next few questions, please think about what you would be likely to do and who you would be likely to have sex with.

If you were going to have sex in the next 3 months, how likely or unlikely is it that every time you have sex, you...

BS3Q7. will keep condoms nearby?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

BS3Q8. will be sure you know your partner's HIV status, (meaning knowing whether your partner is HIV positive or negative) before having sex with him or her?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

BS3Q9. will tell your partner that you need to use a condom?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

Think about what you would be likely to do and who you would be likely to have sex with.

If you were going to have sex in the next 3 months, how likely or unlikely is it that every time you have sex, you...

BS3Q10. will actually use a condom?

- | | |
|---|---------------|
| 1 | Very unlikely |
|---|---------------|

- | | |
|---|-------------------|
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

BS3Q11. will discuss safer sex with your partner?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

Think about what you would be likely to do and who you would be likely to have sex with.

If you were going to have sex in the next 3 months, how likely or unlikely is it that every time you have sex, you...

BS3Q12. will use alcohol before sex?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

BS3Q13. will use drugs before sex?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

BS3Q14. will use a condom even if your partner does NOT want to?

- | | |
|---|-------------------|
| 1 | Very unlikely |
| 2 | Somewhat unlikely |
| 3 | Somewhat likely |
| 4 | Very likely |
| 8 | Refused to Answer |

IV. Stress and Coping

A. Stressful Life Events

The following questions ask you about important things that may have happened to you **in the past.**

BS4Q1. Have you ever been molested, sexually attacked, raped, sexually abused, or forced to have sex?

- | | |
|---|-------------------|
| 1 | Yes |
| 0 | No |
| 8 | Refused to Answer |

BS4Q1a. [If yes to BS4Q1]

What age were you when you were first molested, sexually attacked, raped, sexually abused, or forced to have sex? (select one)

- | | |
|---|--------------------------------|
| 1 | <u>age 12 years or younger</u> |
| 2 | <u>13-18 years old</u> |
| 3 | <u>Over 18 years old</u> |
| 8 | <u>Refused to Answer</u> |

BS4Q2. Have you ever been a victim of a violent crime (like assault or physical abuse) other than sexual abuse?

- | | |
|---|-------------------|
| 1 | Yes |
| 0 | No |
| 8 | Refused to Answer |

BS4Q3. Have you ever traded sex for money, drugs, food or shelter?

- | | |
|---|-------------------|
| 1 | Yes |
| 0 | No |
| 8 | Refused to Answer |

BS4Q4. Have you ever been in prison or in jail?

- | | |
|---|-------------------|
| 1 | Yes |
| 0 | No |
| 8 | Refused to Answer |

B. SETH KALICHMAN-REVISED ACASI FOR STRESSORS

People react to stress in many different ways. In a minute, I will read you a list of possible stressful events. Thinking about your life, tell me how much stress each of these events has caused **YOU** in the past 6 months. For each event I read to you, if you have not experienced it at all in the last 6 months, please check "did not happen in the last six months". Otherwise, please check the box that shows how much stress this event has caused you in the last 6 months.

BS4Q5. Started disability

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q6. Experienced the serious illness or the death of a close friend or family member

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q7. Experienced discrimination of some type

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q8. Found out you had a change in your viral load

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q9. Found out you had a change in your T cell or CD4 count

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q10. Started a new medication

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q11. Got a serious illness

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer
- 9 Did not happen in last 6 months

BS4Q12. Was hospitalized

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer
- 9 Did not happen in last 6 months

BS4Q13. Fired or laid off from a job

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer
- 9 Did not happen in last 6 months

BS4Q14. Put in prison or jail

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer
- 9 Did not happen in last 6 months

BS4Q15. Told your HIV status to someone new

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer
- 9 Did not happen in last 6 months

BS4Q16. An important relationship ended with a separation, divorce, or break-up

- 0 No stress
- 1 A little stress
- 2 Some stress
- 3 A lot of stress
- 8 Refused to Answer

9 Did not happen in last 6 months

BS4Q17. A close friend, or family member or sex partner told you they had HIV

0 No stress
1 A little stress
2 Some stress
3 A lot of stress
8 Refused to Answer
9 Did not happen in last 6 months

BS4Q18. Knowing you infected another person with HIV

0 No stress
1 A little stress
2 Some stress
3 A lot of stress
8 Refused to Answer
9 Did not happen in last 6 months

BS4Q19. Evicted or asked to leave your housing

0 No stress
1 A little stress
2 Some stress
3 A lot of stress
8 Refused to Answer
9 Did not happen in last 6 months

BS4Q20. Had problems with your health insurance

0 No stress
1 A little stress
2 Some stress
3 A lot of stress
8 Refused to Answer
9 Did not happen in last 6 months

BS4Q21. Experienced violence or abuse, either physical or sexual

0 No stress
1 A little stress
2 Some stress
3 A lot of stress
8 Refused to Answer
9 Did not happen in last 6 months

BS4Q22. Traded sex for money, drugs, food or shelter

- | | |
|---|---------------------------------|
| 0 | No stress |
| 1 | A little stress |
| 2 | Some stress |
| 3 | A lot of stress |
| 8 | Refused to Answer |
| 9 | Did not happen in last 6 months |

BS4Q23. Are there any other events that I didn't list that caused you stress in the last 6 months?

- | | |
|---|-------------------|
| 1 | Yes |
| 0 | No |
| 7 | Don't Know |
| 8 | Refused to Answer |

If BS4Q23 is equal to 0, then skip to BS4Q25.

BS4Q24. What were they? Please type in your answer(s).

KALICHMAN-REVISED ACASI FOR STRESSORS (BASED ON PICKING TOP STRESSOR)

BS4Q25. The stressors from the previous screen that you said caused you the most stress are listed below. Please indicate which **ONE STRESSOR** caused you the GREATEST amount of stress in the last 6 months. (Choose one)

JG: program ACASI so only those that got the highest rating by them on the previous screen [s](#) actually get listed here on this screen

- | | |
|----|---|
| 1 | I went on disability |
| 2 | I experienced a serious illness or the death of a close friend or family member |
| 3 | I experienced discrimination of some type |
| 4 | I experienced a change in my viral load |
| 5 | I experienced a change in my T cell or CD4 count |
| 6 | I started a new medication |
| 7 | I got a serious illness |
| 8 | I was hospitalized |
| 9 | My appearance changed |
| 10 | I was fired or laid off from a job |
| 11 | I was put in prison or jail |
| 12 | I told my HIV status to someone new |
| 14 | An important relationship ended with a separation, divorce, or break-up |

- 15 A close friend, family member, or sex partners told me they had HIV
- 16 I infected another person with HIV
- 17 I was evicted or asked to leave my housing
- 18 I had problems with my health insurance
- 19 I experienced violence or abuse, physical or sexual
- 20 I traded sex for money, drugs, food or shelter
- 21 *If they checked other above and typed it in, then shouldn't it be programmed to automatically show that*
- 22 Other: _____ *then this one, 22 would be if they at this point, decide there is something else that is more stressful. Although do we really need to give them this option twice???*
- 98 Refused to Answer

If BS4Q25 is equal to 1, then skip to instruction before BS4Q26 (had to change all the numbering here).

If BS4Q25 is equal to 2, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 3, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 4, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 5, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 6, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 7, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 8, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 9, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 10, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 11, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 12, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 13, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 14, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 15, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 16, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 17, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 18, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 19, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 20, then skip to instruction before BS4Q26.

If BS4Q25 is equal to 21, then skip to instruction before BS4Q26.

BS4Q25a. Please type in what other stressor you found to be the MOST stressful.

Coping: Combination of Kalichman and Folkman's short version of Ways of Coping

People tend to deal with stress in different ways. Please think about [Response to BS4Q25], the situation that you indicated on the previous screen that was the most stressful for you. Please check how much you used each of the following ways to help you deal with [Response to BS4Q25a].

BS4Q26. I tried to keep my feelings to myself.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q27. I talked to someone to find out more information.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q28. I knew what had to be done, and I worked harder at it.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q29. I prayed.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

Please check how much you used each of the following ways to help you deal with [Response to BS4Q25].

BS4Q30. I went on as if nothing had happened.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q31. I made a plan of action and followed it.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q32. I asked a friend or relative for advice.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q33. I tried to forget the whole thing.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

Please check how much you used each of the following ways to help you deal with [Response to BS4Q25a].

BS4Q34. I tried to make myself feel better by sleeping, or eating, or drinking, or smoking, or using drugs, etc.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q35. I concentrated on what I had to do next.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q36. I talked to someone about how I was feeling.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q37. I criticized or lectured myself.

- | | |
|---|-----------------------|
| 1 | Not used at all |
| 2 | Used a little |
| 3 | Used some of the time |
| 4 | Used a lot |
| 8 | Refused to Answer |

Please check how much you used each of the following ways to help you deal with [Response to BS4Q25a].

BS4Q38. I let my feelings out somehow.

- | | |
|---|-----------------------|
| 1 | Not used at all |
| 2 | Used a little |
| 3 | Used some of the time |
| 4 | Used a lot |
| 8 | Refused to Answer |

BS4Q39. I found new faith.

- | | |
|---|-----------------------|
| 1 | Not used at all |
| 2 | Used a little |
| 3 | Used some of the time |
| 4 | Used a lot |
| 8 | Refused to Answer |

BS4Q40. I rediscovered what is important in life.

- | | |
|---|-----------------------|
| 1 | Not used at all |
| 2 | Used a little |
| 3 | Used some of the time |
| 4 | Used a lot |
| 8 | Refused to Answer |

BS4Q41. I avoided being with people in general.

- | | |
|---|-----------------------|
| 1 | Not used at all |
| 2 | Used a little |
| 3 | Used some of the time |
| 4 | Used a lot |
| 8 | Refused to Answer |

Please check how much you used each of the following ways to help you deal with [Response to BS4Q25a].

BS4Q42. I kept others from knowing how bad things were.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q43. I made a promise to myself that things would be different next time.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q44. I wished that the situation would go away or somehow be over with.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

BS4Q45. I stood my ground and fought for what I wanted.

- 1 Not used at all
- 2 Used a little
- 3 Used some of the time
- 4 Used a lot
- 8 Refused to Answer

V. Stigma

Berger et al, 2001

Next are some things people living with HIV may have experienced in the past or may be experiencing right now. We realize the next few questions may make you feel uncomfortable. (PAUSE) For each one you see on the screen, please pick how much you agree or disagree with it by clicking on the answer that best fits you.

BS5Q1. In some areas of my life, no one knows that I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q2. Telling someone I have HIV is risky.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q3. I work hard to keep my HIV a secret.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q4. People I care about stopped calling after finding out I had HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q5. I am very careful who I tell that I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q6. Some people I know have become more distant from me after finding out I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q7. I feel the need to hide the fact that I have HIV.

- 1 Agree a lot
- 2 Agree a little

- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q8. I have been hurt by how people reacted after finding out I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q9. I worry that people who know I have HIV will tell others.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q10. Some people avoid touching me after they find out I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q11. People physically backed away from me when they found out I had HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q12. I have stopped socializing with some people because of their reactions to my having HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q13. I lost friends by telling them I have HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q14. I have told people close to me to keep the fact that I have HIV a secret.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

BS5Q15. People seemed afraid of me once they found out I had HIV.

- 1 Agree a lot
- 2 Agree a little
- 3 Disagree a little
- 4 Disagree a lot
- 7 Don't Know
- 8 Refused to Answer

VI. Discrimination

2001 CHIS Survey

BS6Q1. Thinking of your experiences with receiving health care in the past 12 months, have you ever felt you were discriminated against for any reason?

- 1 Yes
- 2 No->SKIP TO BS7Q1
- 8 Refuse to Answer>SKIP TO BS7Q1
- 9 Not Applicable>SKIP TO BS7Q1

2001 CHIS Survey

BS6Q2. What do you think was the biggest reason that you were discriminated against? (Choose one)

- 01 Age
- 02 Race or ethnic group
- 03 Language/accent
- 04 HIV status
- 05 Body weight
- 06 Insurance type
- 07 Income level
- 08 Health or disability
- 09 Religion

- | | |
|----|------------------------------------|
| 10 | Sexual orientation |
| 11 | Gender/sex |
| 12 | Some other reason (specify): _____ |
| 97 | Don't Know |
| 98 | Refuse to Answer |
| 99 | Not applicable |

VII. Sexual Behavior Self Efficacy

PARSONS ET. AL, 1998

Here are some questions about your sexual activity. When we say “partner”, we mean a boyfriend, girlfriend, spouse, or person who you have sexual activity with. This can include kissing, petting, oral sex, and intercourse. For the next questions, please tell me on a scale of 1 to 10, how confident you feel that you could do each of the following **today if you decided to do it** with zero (00) being “not at all confident” and 10 being “completely confident”.

BS7Q1. How confident are you that you can talk with your partner(s) about sex?

- | | |
|----|----------------------|
| 00 | Not at all confident |
| 01 | |
| 02 | |
| 03 | |
| 04 | |
| 05 | Somewhat confident |
| 06 | |
| 07 | |
| 08 | |
| 09 | |
| 10 | Completely confident |
| 98 | Refused to Answer |

BS7Q2. How confident are you that you can use a condom correctly?

- | | |
|----|----------------------|
| 00 | Not at all confident |
| 01 | |
| 02 | |
| 03 | |
| 04 | |
| 05 | Somewhat confident |
| 06 | |
| 07 | |
| 08 | |
| 09 | |
| 10 | Completely confident |
| 98 | Refused to Answer |

BS7Q3. What if you DID want to have vaginal or anal sex but you didn't have any condoms? How confident are you that you could switch to other sexual activities instead?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q4. How confident are you that you can convince your partner(s) to use condoms every single time you have sex?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q5. How confident are you that you could say "**No**" to having sex with your partner?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q6. If a partner tells you that they would not use condoms, how confident are you that you could refuse to have sex with them?

00	Not at all confident
----	----------------------

01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q7. How confident are you that you can talk about using condoms with **EVERY** future partner?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

Now, please rate how confident you are that you can use condoms in each of the following situations today, if you decided to do it:

BS7Q8. How confident are you that you can use condoms if you are feeling depressed?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q9. How confident are you that you can use condoms when you've been drinking or using drugs before sex?

00	Not at all confident
----	----------------------

01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q10. How confident are you that you can use condoms if condoms are NOT readily available and you (or your partner) have to go and get them?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q11. How confident are you that you can use condoms if you are feeling good?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q12. How confident are you that you can use condoms if you are in love with your partner?

00	Not at all confident
01	
02	
03	

04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q13. How confident are you that you can use condoms with a new partner?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q14. How confident are you that you can use condoms if you won't see this partner again?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q15. How confident are you that you can use condoms with a partner who you have not used condoms with before?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident

06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

BS7Q16. How confident are you that you can use a condom when your partner doesn't want to use a condom?

00	Not at all confident
01	
02	
03	
04	
05	Somewhat confident
06	
07	
08	
09	
10	Completely confident
98	Refused to Answer

VIII. Risky Sexual Behavior

SEXUAL RISK ASSESSMENT FOR MEN- Sexual Behavior with Women

GENDER

BS8Q1. Are you: (Select one)

1	Male
2	Female
3	Transgender (Male to Female)
4	Transgender (Female to Male)
8	Refused to Answer

If BS8Q1 is equal to 1, then skip to M1.

If BS8Q1 is equal to 2, then skip to W1.

If BS8Q1 is equal to 3, then continue to BS8Q2.

If BS8Q1 is equal to 4, then skip to BS8Q2.

BS8Q2. Do you have a penis?

1	Yes
0	No

If BS8Q2 is equal to 1, then skip to M1.

If BS8Q2 is equal to 0, then skip to W1.

The next questions are about the sexual relationships you might have had in the **last 3 months**. Again, please remember that all your answers are strictly confidential. Your answers are protected by law and cannot be shared with any outside organization or agency not involved with this study.

The following questions ask about your sexual behavior with partners who are HIV-positive and HIV-negative, as well as partners whose HIV status you are not sure of. Again, these questions are about the **last 3 months**.

M1. Have you had any female sex partners in the **last 3 months**? By female sex partners, we mean women with whom you had vaginal, anal or oral sex, with or without ejaculation.

	1	Yes
	0	No
	8	Refuse to

Answer

If M1 is equal to 0, then skip to instruction before M15.

M1a. How many female sexual partners have you had in the last 3 months?

	— — —	
	998	Refuse to

Answer

If M1a is greater than 1, then skip to instruction before M2.

M1b. What was this partner's HIV status? (Choose one)

	0	Positive
	1	Negative
	88	Not Sure
	998	Refuse to

Answer

M1c. Were you in a primary relationship with this sex partner? By primary we mean someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1	Yes
0	No
8	Refuse to

Answer

M1d. Did this partner know that you were HIV-positive because you told her that you were positive? (Choose one)

0	No
1	Yes
88	Not Sure
998	Refuse to

Answer

If M1b is equal to 0, then skip to instruction before M6.

If M1b is equal to 1, then skip to instruction before M9.

If M1b is equal to 88, then skip to instruction before M12.

The next questions ask about the HIV-status of the sexual partners we asked about in the last question. When we say **HIV status**, we mean whether you know, for certain, whether your partners are **either** HIV positive, HIV negative, or not sure. First, we will ask you about your **HIV-positive** sexual partner(s). Then we will ask you about your **HIV-negative** sexual partner(s). Lastly, we will ask you about sex partner(s) whose **HIV status you are not sure of**. For these next questions, please keep in mind that the number of HIV-positive sexual partners, HIV-negative sexual partners, and partners whose HIV status you are not sure of **MUST EQUAL** the **total** number of partners that you entered in the last question. If you want to, write your number of partners down on the sheet of scratch paper provided to help you answer the next questions.

M2. **In the last three months...** How many of your [Response to M1a] female sex partners were **HIV-positive**?

— — —
998 Refuse to

Answer

If M2 is greater than M1a then The number of your HIV-positive sex partners cannot be greater than your total number of sex partners." skip to M2.

If M2 is equal to 0 or M2 is equal to "Refuse to Answer", then skip to instruction before M3.

M2a. Of this/these [Response to M2] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If M2a is greater than M2 then the number of partners you told cannot be greater than your number of partners." Skip to M2a.

M3. **In the last three months...** How many of your [Response to M1a] female sex partners were **HIV-negative**?

— — —
998 Refuse to

Answer

If M3 is greater than M1a then The number of your HIV-negative sex partners cannot be greater than your total number of sex partners." skip to M3.

If M3 is equal to 0 or M3 is equal to "Refuse to Answer", then skip to instruction before M4.

M3a. Of this/these [Response to M3] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If M3a is greater than M3 then The number of partners you told cannot be greater than your number of partners." skip to M3a.

M4. **In the last three months...** How many of your [Response to M1a] female sex partners' HIV status were you unsure of?

— — —
998 Refuse to

Answer

If M4 is greater than M1a then The number of your sex partners whose status you were not sure of cannot be greater than your total number of sex partners." skip to M4.

If M2 + M3 + M4 is not equal to M1a and M2 is not equal to "Refuse to Answer" and M3 is not equal to "Refuse to Answer" and M4 is not equal to "Refuse to Answer" then The number of HIV+, HIV-, and unknown HIV status partners must equal your total number of partners. We will now ask you about these partners again." skip to M2.

If M4 is equal to 0 or M4 is equal to "Refuse to Answer", then skip to instruction before M5.

M4a. Of this/these [Response to M4] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If M4a is greater than M4 then The number of partners you told cannot be greater than your number of partners." skip to M4a.

M5. Were you in a primary relationship with at least **one** female sex partner during the **last 3 months**? This would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1 Yes
0 No
8 Refuse to

Answer

If M5 is equal to 0, then skip to instruction before M6.

M5a. How many primary partners have you had in the last 3 months? (Choose one)

0 1
1 More than 1
8 Refuse to

Answer

If M5a is equal to 1, then skip to instruction before M5d.

M5b. What is your primary partner's HIV status? (Choose one)

00 Positive
01 Negative
88 Not Sure
98 Refuse to

Answer

M5c. Did your primary partner know that you were HIV-positive because you told her that you were positive?

1 Yes
0 No
8 Refuse to

Answer

If M5a is equal to 0, then skip to instruction before M6.

M5d. How many primary partners have you had in the last 3 months? — — —

998 Refuse to

Answer

If M5d is greater than M1a then The number of your primary partners cannot be greater than your total number of sex partners." skip to M5d.

M5e. How many of your [Response to M5d] primary partners were HIV-positive?

— — —
998 Refuse to

Answer

If M5e is greater than M5d then The number of HIV-positive primary partners cannot be greater than the number of primary partners" skip to M5e.

If M5e is greater than M2 then The number of HIV-positive primary partners cannot be greater than the number of your HIV-positive partners" skip to M5e.

If M5e is equal to 0 or M5e is equal to "Refuse to Answer", then skip to instruction before M5f.

M5e1. Of this/these [Response to M5e] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If M5e1 is greater than M5e then the number of partners you told cannot be greater than your number of partners." Skip to M5e.

M5f. How many of your [Response to M5d] primary partners were HIV-negative?

— — —
998

Refuse to

Answer

If M5f is greater than M5d then the number of HIV-negative primary partners cannot be greater than the number of primary partners." Skip to M5f.

If M5f is greater than M3 then the number of HIV-negative primary partners cannot be greater than the number of your HIV-negative partners" Skip to M5f.

If M5f is equal to 0 or M5f is equal to "Refuse to Answer", then skip to instruction before M5g.

M5f1. Of this/these [Response to M5f] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If M5f1 is greater than M5f then the number of partners you told cannot be greater than your number of partners." Skip to M5f.

M5g. How many of your [Response to M5d] primary partners' HIV status were you unsure of?

— — —
998

Refuse to

Answer

If M5g is greater than M5d then the number of primary partners whose HIV status you are unsure of cannot be greater than the number of primary partners." Skip to M5g.

If M5g is greater than M4 then the number of primary partners whose HIV status you are unsure of cannot be greater than the number of your unknown HIV-status partners." Skip to M5g.

If M5g is equal to 0 or M5g is equal to "Refuse to Answer", then skip to instruction before M6.

M5g1. Of this/these [Response to M5g] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If M5g1 is greater than M5g then The number of partners you told cannot be greater than your number of partners." skip to M5g.

If M5e + M5f + M5g is not equal to M5d then The sum of the number of HIV-positive, HIV-negative, and unknown HIV status primary partners must equal your total number of primary partners" skip to M5e.

If M1a is equal to 1 and M1b is not equal to 0 or M1a is greater than 1 and M2 is equal to 0, then skip to instruction before M9.

HIV-POSITIVE PARTNERS (the yellow sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-positive** female partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

M6. **In the last 3 months:**

How many times did you ejaculate or cum in this/these HIV-positive partner(s)' mouth(s) without a condom?

Answer ___ ___ ___
998 Refuse to

M7. How many times did you have vaginal sex with this/these HIV-positive partner(s)? This would be with or without a condom and whether or not you ejaculated.

Answer ___ ___ ___
998 Refuse to

If M7 is equal to 0 or M7 is equal to "Refuse to Answer", then skip to instruction before M8.

M7a. How many of these times was a condom used?

Answer ___ ___ ___
998 Refuse to

If M7a is greater than M7 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M7.

M8. How many times did you have anal sex with your HIV-positive partner(s)? This would be with or without a condom and whether or not you ejaculated.

Answer ___ ___ ___
998 Refuse to

If M8 is equal to 0 or M8 is equal to "Refuse to Answer", then skip to instruction before M9.

M8a. How many of these times was a condom used?

Answer ___ ___ ___
998 Refuse to

If M8a is greater than M8 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M8.

If M1a is equal to 1 and M1b is not equal to 1 or M1a is greater than 1 and M3 is equal to 0, then skip to instruction before M12.

HIV-NEGATIVE PARTNERS (the green sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-negative** female partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

M9. **In the last 3 months:**

How many times did you ejaculate or cum in this/these HIV-negative partner(s)' mouth(s) without a condom?

___ ___ ___
998

Refuse to

Answer

M10. How many times did you have vaginal sex with this/these HIV-negative partner(s)? This would be with or without a condom and whether or not you ejaculated.

___ ___ ___
998

Refuse to

Answer

If M10 is equal to 0 or M10 is equal to "Refuse to Answer", then skip to instruction before M11.

M10a. How many of these times was a condom used?

___ ___ ___
998

Refuse to

Answer

If M10a is greater than M10 then The number of times you used a condom cannot be greater than the number of times having sex." skip to M10.

M11. How many times did you have anal sex with your HIV-negative partner(s)? This would be with or without a condom and whether or not you ejaculated.

___ ___ ___
998

Refuse to

Answer

If M11 is equal to 0 or M11 is equal to "Refuse to Answer", then skip to instruction before M12.

M11a. How many of these times was a condom used?

___ ___ ___
998

Refuse to

Answer

If M11a is greater than M11 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M11.

If M1a is equal to 1 and M1b is not equal to 88 or M1a is greater than 1 and M4 is equal to 0, then skip to instruction before M15.

PARTNERS OF UNCERTAIN HIV-STATUS (the blue sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your female partner(s) whose **HIV status you were not sure of**.

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

M12. **In the last 3 months:**

How many times did you ejaculate or cum in this/these partner(s)' mouth(s) without a condom?

___ ___
998

Refuse to

Answer

M13. How many times did you have vaginal sex with this/these partner(s) whose status you were not sure of? This would be with or without a condom and whether or not you ejaculated. ___ ___

998

Refuse to

Answer

If M13 is equal to 0 or M13 is equal to "Refuse to Answer", then skip to instruction before M14.

M13a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M13a is greater than M13 then The number of times you used a condom cannot be greater than the number of times having sex." skip to M13.

M14. How many times did you have anal sex with your partner(s) whose status you were not sure of? This would be with or without a condom and whether or not you ejaculated. ___ ___

998

Refuse to

Answer

If M14 is equal to 0 or M14 is equal to "Refuse to Answer", then skip to instruction before M15.

M14a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M14a is greater than M14 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M14.

SEXUAL RISK ASSESSMENT FOR MEN- Sexual Behavior with Men

The following questions ask about your sexual behavior with partners who are HIV-positive and HIV-negative, as well as partners whose HIV status you were not sure of. Again, these questions refer to the **last 3 months**.

M15. Have you had any male sex partners in the **last 3 months**? By male sex partners, we mean men with whom you had anal or oral sex, with or without ejaculation.

1	Yes
0	No
8	Refuse to

Answer

If M15 is equal to 0, then skip to instruction before SUQ1.

M15a. How many male sexual partners have you had in the last 3 months?

— — —	Refuse to
998	

Answer

If M15a is greater than 1, then skip to instruction before M16.

M15b. What is this partner's HIV status? (Choose one)

0	Positive
1	Negative
88	Not Sure
998	Refuse to

Answer

M15c. Were you in a primary relationship with this sex partner? This would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1	Yes
0	No
8	Refuse to

Answer

M15d. Did this partner know that you were HIV-positive because you told him that you were positive? (Choose one)

0	No
1	Yes
88	Not Sure
998	Refuse to

Answer

If M15b is equal to 0, then skip to instruction before M20a.

If M15b is equal to 1, then skip to instruction before M23a.

If M15b is equal to 88, then skip to instruction before M26a.

The next questions ask about the HIV-status of the sexual partners we asked about in the last question. When we say **HIV status**, we mean whether you know, for certain, whether your partners are **either** HIV positive, HIV negative, or not sure. First, we will ask you about your **HIV-positive** sexual partner(s). Then we will ask you about your **HIV-negative** sexual partner(s). Lastly, we will ask you about sex partner(s) whose **HIV status you are not sure of**. For these next questions, please keep in mind that the number of HIV-positive sexual partners, HIV-negative sexual partners, and partners whose HIV status you are not sure of **MUST EQUAL** the **total** number of partners that you entered in the last question. If you want to, write your number of partners down on the sheet of scratch paper provided to help you answer the next questions.

M16. In the last three months... How many of your [Response to M15a] male sex partners were HIV-positive?

___ ___ ___
998

Refuse to

Answer

If M16 is greater than M15a then the number of your HIV-positive sex partners cannot be greater than your total number of sex partners." Skip to M16.

If M16 is equal to 0 or M16 is equal to "Refuse to Answer", then skip to instruction before M17.

M16a. Of this/these [Response to M16] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

___ ___ ___
998

Refuse to

Answer

If M16a is greater than M16 then the number of partners you told cannot be greater than your number of partners." Skip to M16.

M17. In the last three months... How many of your [Response to M15a] male sex partners were HIV-negative?

___ ___ ___
998

Refuse to

Answer

If M17 is greater than M15a then the number of your HIV-negative sex partners cannot be greater than your total number of sex partners." Skip to M17.

If M17 is equal to 0 or M17 is equal to "Refuse to Answer", then skip to instruction before M18.

M17a. Of this/these [Response to M17] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

___ ___ ___
998

Refuse to

Answer

If M17a is greater than M17 then the number of partners you told cannot be greater than your number of partners." Skip to M17.

M18. In the last three months... How many of your [Response to M15a] male partners' HIV status were you unsure of?

___ ___ ___
998

Refuse to

Answer

If M18 is greater than M15a then the number of your partners whose HIV status you were not sure of cannot be greater than your total number of sex partners." Skip to M18.

If M16 + M17 + M18 is not equal to M15a and M16 is not equal to "Refuse to Answer" and M17 is not equal to "Refuse to Answer" and M18 is not equal to "Refuse to Answer" then The number of HIV+, HIV-, and unknown HIV status partners must equal your total number of partners. We will now ask you about these partners again." skip to M16.

If M18 is equal to 0 or M18 is equal to "Refuse to Answer", then skip to M19.

M18a. Of this/these [Response to M18] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

___ ___ ___
998

Refuse to

Answer

If M18a is greater than M18 then the number of partners you told cannot be greater than your number of partners." Skip to instruction before M18a.

M19. Were you in a primary relationship with at least **one** male sex partner during the **last 3 months**? This would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1 Yes
0 No
8 Refuse to

Answer

If M19 is equal to 0, then skip to instruction before M20a.

M19a. How many primary partners have you had in the last 3 months? (Choose one)

0 1
1 More than 1
8 Refuse to

Answer

If M19a is equal to 1, then skip to instruction before M19d.

M19b. What is your primary partner's HIV status? (Choose one)

00 Positive
01 Negative
88 Not Sure
98 Refuse to

Answer

M19c. Did your primary partner know that you were HIV-positive because you told him that you were positive?

1 Yes
0 No
8 Refuse to

Answer

If M19a is equal to 0, then skip to instruction before M20a.

M19d. How many primary partners have you had in the last 3 months? _ _ _

998 Refuse to

Answer

If M19d is greater than M15a then the number of your primary partners cannot be greater than your total number of sex partners" Skip to M19d.

M19e. How many of your [Response to M19d] primary partners were HIV-positive?

_ _ _
998 Refuse to

Answer

If M19e is greater than M19d then the number of HIV-positive primary partners cannot be greater than the number of primary partners." Skip to M19e.

If M19e is greater than M16 then the number of HIV-positive primary partners cannot be greater than the number of your HIV-positive partners." Skip to M19e.

If M19e is equal to 0 or M19e is equal to "Refuse to Answer", then skip to instruction before M19f.

M19e1. Of this/these [Response to M19e] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

_ _ _
998 Refuse to

Answer

If M19e1 is greater than M19e then the number of partners you told cannot be greater than your number of partners." Skip to M19e.

M19f. How many of your [Response to M19d] primary partners were HIV-negative?

— — —
998

Refuse to

Answer

If M19f is greater than M19d then the number of HIV-negative primary partners cannot be greater than the number of primary partners." Skip to M19f.

If M19f is greater than M17 then the number of HIV-negative primary partners cannot be greater than the number of your HIV-negative partners." Skip to M19f.

If M19f is equal to 0 or M19f is equal to "Refuse to Answer", then skip to instruction before M19g.

M19f1. Of this/these [Response to M19f] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If M19f1 is greater than M19f then the number of partners you told cannot be greater than your number of partners." Skip to Mf.

M19g. How many of your [Response to M19d] primary partners' HIV status were you unsure of?

— — —
998

Refuse to

Answer

If M19g is greater than M19d then the number of primary partners whose HIV status you were unsure of cannot be greater than the number of primary partners." Skip to M19g.

If M19g is greater than M18 then the number of primary partners whose HIV status you are unsure of cannot be greater than the number of your unknown HIV-status partners." Skip to M19g.

If M19g is equal to 0 or M19g is equal to "Refuse to Answer", then skip to instruction before M20a.

M19g1. Of this/these [Response to M19g] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If M19g1 is greater than M19g then the number of partners you told cannot be greater than your number of partners." Skip to M19g.

If M19e + M19f + M19g is not equal to M19d then The sum of the number of HIV-positive, HIV- negative and unknown HIV status primary partners must equal your total number of primary partners" skip to M19e.

If M15a is equal to 1 and M15b is not equal to 0 or M15a is greater than 1 and M16 is equal to 0, then skip to instruction before M23a.

HIV-POSITIVE PARTNERS (the yellow sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-positive** male partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

M20a. **In the last 3 months:**
How many times did you have oral sex without a condom when your HIV-positive partner(s) ejaculated or came in your mouth?

— — —
998 Refuse to

Answer

M20b. **In the last 3 months:**
How many times did you ejaculate or cum in this/these HIV-positive partner(s)' mouth(s) without a condom?

— — —
998 Refuse to

Answer

M21. How many times did you have anal sex with this/these HIV-positive partner(s) when his/their penis was in your rectum? This would be with or without a condom and whether or not he/they ejaculated.

— — —
998 Refuse to

Answer

If M21 is equal to 0, then skip to instruction before M22.

M21a. How many of these times was a condom used?

— — —
998 Refuse to

Answer

If M21a is greater than M21 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M21.

M22. How many times did you have anal sex with your HIV-positive partner(s) when your penis was in his/their rectum? This would be with or without a condom and whether or not you ejaculated.

— — —
998 Refuse to

Answer

If M22 is equal to 0, then skip to instruction before M23a.

M22a. How many of these times was a condom used?

— — —
998 Refuse to

Answer

If M22a is greater than M22 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M22.

If M15a is equal to 1 and M15b is not equal to 1 or M15a is greater than 1 and M17 is equal to 0, then skip to instruction before M26a.

HIV-NEGATIVE PARTNERS (the green sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-negative** male partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

M23a. **In the last 3 months:**

How many times did you have oral sex without a condom when your HIV-negative partner(s) ejaculated or came in your mouth?

___ ___
998

Refuse to

Answer

M23b. **In the last 3 months:**

How many times did you ejaculate or cum in this/these HIV-negative partner(s)' mouth(s) without a condom?

___ ___
998

Refuse to

Answer

M24. How many times did you have anal sex with this/these HIV-negative partner(s) when his/their penis was in your rectum? This would be with or without a condom and whether or not he/they ejaculated.

___ ___
998

Refuse to

Answer

If M24 is equal to 0, then skip to instruction before M25.

M24a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M24a is greater than M24 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M24.

M25. How many times did you have anal sex with your HIV-negative partner(s) when your penis was in his/their rectum? This would be with or without a condom and whether or not you ejaculated.

___ ___
998

Refuse to

Answer

If M25 is equal to 0, then skip to instruction before M26a.

M25a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M25a is greater than M25 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M25.

If M15a is equal to 1 and M15b is not equal to 88 or M15a is greater than 1 and M18 is equal to 0, then skip to instruction before SUQ1.

PARTNERS OF UNCERTAIN HIV-STATUS (the blue sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your male partner(s) whose **HIV status you were not sure of**.

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and continued. Include those occasions when we ask you about intercourse without condoms.

M26a. **In the last 3 months:**

How many times did you have oral sex without a condom when your partner(s) whose HIV status you were not sure of ejaculated or came in your mouth?

___ ___
998

Refuse to

Answer

M26b. How many times did you ejaculate or cum in this/these partner(s)' mouth(s) without a condom?

___ ___
998

Refuse to

Answer

M27. How many times did you have anal sex with your partner(s) whose HIV status was unknown when his/their penis was in your rectum? This would be with or without a condom and whether or not he/they ejaculated.

___ ___
998

Refuse to

Answer

If M27 is equal to 0, then skip to instruction before M28.

M27a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M27a is greater than M27 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M27.

M28. How many times did you have anal sex with your partner(s) whose HIV status was unknown when your penis was in his/their rectum? This would be with or without a condom and whether or not you ejaculated.

___ ___
998

Refuse to

Answer

If M28 is equal to 0, then skip to instruction before SUQ1.

M28a. How many of these times was a condom used?

___ ___
998

Refuse to

Answer

If M28a is greater than M28 then the number of times you used a condom cannot be greater than the number of times having sex." Skip to M28.

Skip to instruction before SUQ1.

SEXUAL RISK ASSESSMENT FOR WOMEN- Sexual Behavior with Men

These next questions are about the sexual relationships you might have had in the **last 3 months**. Again, please remember that all data are strictly confidential and your responses are protected by law and cannot be disclosed to any outside organization or agency not involved with this study.

The following questions ask about your sexual behavior with partners who are HIV-positive and HIV-negative, as well as partners whose HIV status you were not sure of. Again, these questions refer to the **last 3 months**.

W1. Have you had any male sex partners in the **last 3 months**? By male sex partner, we mean men with whom you had vaginal, anal or oral sex, with or without ejaculation.

1	Yes
0	No
8	Refuse to

Answer

If W1 is equal to 0, then skip to instruction before SUQ1.

W1a. How many male sexual partners have you had in the **last 3 months**?

— — —	Refuse to
998	

Answer

If W1a is greater than 1, then skip to instruction before W2.

W1b. What is this partner's HIV status? (Choose one)

0	Positive
1	Negative
88	Not Sure
998	Refuse to

Answer

W1c. Were you in a primary relationship with this sex partner? This would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1	Yes
0	No
8	Refuse to

Answer

W1d. Did this partner know that you were HIV-positive because you told him that you were positive? (Choose one)

0	No
1	Yes
88	Not Sure
998	Refuse to

Answer

If W1b is equal to 0, then skip to instruction before W6.

If W1b is equal to 1, then skip to instruction before W9.

If W1b is equal to 88, then skip to instruction before W12.

The next questions ask about the HIV-status of the sexual partners we asked about in the last question. When we say **HIV status**, we mean whether you know, for certain, whether your partners are **either** HIV positive, HIV negative, or not sure. First, we will ask you about your **HIV-positive** sexual partner(s). Then we will ask you about your **HIV-negative** sexual partner(s). Lastly, we will ask you about sex partner(s) whose **HIV status you are not sure of**. For these next questions, please keep in mind that the number of HIV-positive sexual partners, HIV-negative sexual partners, and partners whose HIV status you are not sure of **MUST EQUAL** the **total** number of partners that you entered in the last question. If you want to, write your number of partners down on the sheet of scratch paper provided to help you answer the next questions.

W2. **In the last three months...** How many of your [Response to W1a] male sex partners were **HIV-positive**?

— — —
998 Refuse to

Answer

If W2 is greater than W1a then the number of your HIV-positive sex partners cannot be greater than your total number of sex partners." Skip to W2.

If W2 is equal to 0 or W2 is equal to "Refuse to Answer", then skip to instruction before W3.

W2a. Of this/these [Response to W2] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If W2a is greater than W2 then the number of partners you told cannot be greater than your number of partners." Skip to W2.

W3. **In the last three months...** How many of your [Response to W1a] male sex partners were **HIV-negative**?

— — —
998 Refuse to

Answer

If W3 is greater than W1a then the number of your HIV-negative sex partners cannot be greater than your total number of sex partners." Skip to W3.

If W3 is equal to 0 or W3 is equal to "Refuse to Answer", then skip to instruction before W4.

W3a. Of this/these [Response to W3] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If W3a is greater than W3 then the number of partners you told cannot be greater than your number of partners." Skip to W3.

W4. **In the last three months...** How many of your [Response to W1a] male partners' HIV status were you unsure of?

— — —
998 Refuse to

Answer

If W4 is greater than W1a then the number of your partners whose HIV status you are not sure of cannot be greater than your total number of sex partners." Skip to W4.

If W2 + W3 + W4 is not equal to W1a and W2 is not equal to "Refuse to Answer" and W3 is not equal to "Refuse to Answer" and W4 is not equal to "Refuse to Answer" then The number of HIV+, HIV-, and unknown HIV status partners must equal your total number of partners. We will now ask you about these partners again." Skip to W2.

If W4 is equal to 0 or W4 is equal to "Refuse to Answer", then skip to W5.

W4a. Of this/these [Response to W4] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998 Refuse to

Answer

If W4a is greater than W4 then the number of partners you told cannot be greater than your number of partners." Skip to instruction before W4a.

W5. Were you in a primary relationship with at least **one** male sex partner during the **last 3 months**? This would be someone you have lived with or seen a lot, and to whom you have felt a special emotional commitment.

1 Yes
0 No
8 Refuse to

Answer

If W5 is equal to 0, then skip to instruction before W6.

W5a. How many primary partners have you had in the last 3 months? (Choose one)

0 1
1 More than 1
8 Refuse to

Answer

If W5a is equal to 1, then skip to instruction before W5d.

W5b. What is your primary partner's HIV status? (Choose one)

00 Positive
01 Negative
88 Not Sure
98 Refuse to

Answer

W5c. Did your primary partner know that you were HIV-positive because you told him that you were positive?

1 Yes
0 No
8 Refuse to

Answer

If W5a is equal to 0, then skip to instruction before W6.

W5d. How many primary partners have you had in the last 3 months? — — —

998 Refuse to

Answer

If W5d is greater than W1a then the number of your primary partners cannot be greater than your total number of sex partners." Skip to W5d.

W5e. How many of your [Response to W5d] primary partners were HIV-positive?

— — —
998 Refuse to

Answer

If W5e is greater than W5d then the number of HIV-positive primary partners cannot be greater than the number of primary partners." Skip to W5e.

If W5e is greater than W2 then the number of HIV-positive primary partners cannot be greater than the number of your HIV-positive partners." Skip to W5e.

If W5e is equal to 0 or W5e is equal to "Refuse to Answer", then skip to instruction before W5f.

W5e1. Of this/these [Response to W5e] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If W5e1 is greater than W5e then the number of partners you told cannot be greater than your number of partners." Skip to W5e.

W5f. How many of your [Response to W5d] primary partners were HIV-negative?

— — —
998

Refuse to

Answer

If W5f is greater than W5d then the number of HIV-negative primary partners cannot be greater than the number of primary partners." Skip to W5f.

If W5f is greater than W3 then the number of HIV-negative primary partners cannot be greater than the number of your HIV-negative partners." Skip to W5f.

If W5f is equal to 0 or W5f is equal to "Refuse to Answer", then skip to instruction before W5g.

W5f1. Of this/these [Response to W5f] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If W5f1 is greater than W5f then the number of partners you told cannot be greater than your number of partners." Skip to W5f.

W5g. How many of your [Response to W5d] primary partners' HIV status were you unsure of?

— — —
998

Refuse to

Answer

If W5g is greater than W5d then the number of primary partners whose HIV status you were unsure of cannot be greater than the number of primary partners." Skip to W5g.

If W5g is greater than W4 then The number of primary partners whose HIV status you are unsure of cannot be greater than the number of your unknown HIV-status partners." Skip to W5g.

If W5g is equal to 0 or W5g is equal to "Refuse to Answer", then skip to instruction before W6.

W5g1. Of this/these [Response to W5g] partner(s), how many knew that you were HIV-positive because you told them that you were positive?

— — —
998

Refuse to

Answer

If W5g1 is greater than W5g then the number of partners you told cannot be greater than your number of partners." Skip to W5g.

If W5e + W5f + W5g is not equal to W5d then The sum of the number of HIV-positive, HIV-negative, and unknown HIV status primary partners must equal your total number of primary partners." Skip to W5e.

If W1a is equal to 1 and W1b is not equal to 0 or W1a is greater than 1 and W2 is equal to 0, then skip to instruction before W9.

HIV-POSITIVE PARTNERS (the yellow sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-positive** male partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

W6. **In the last 3 months:**

How many times did you have oral sex without a condom when your HIV-positive partner(s) ejaculated or came in your mouth?

— — —
998

Refuse to

Answer

W7. How many times did you have vaginal sex with your HIV-positive partner(s)? This would be with or without a condom and whether or not he/they ejaculated.

— — —
998

Refuse to

Answer

If W7 is equal to 0 or W7 is equal to "Refuse to Answer", then skip to instruction before W8.

W7a. How many of these times was a condom used?

— — —
998

Refuse to

Answer

If W7a is greater than W7 then the number of times using a condom cannot be greater than the number of times having sex." Skip to W7.

W8. How many times did you have anal sex with your HIV-positive partner(s)? This would be with or without a condom and whether or not he/they ejaculated.

— — —
998

Refuse to

Answer

If W8 is equal to 0 or W8 is equal to "Refuse to Answer", then skip to instruction before W9.

W8a. How many of these times was a condom used?

— — —
998

Refuse to

Answer

If W8a is greater than W8 then the number of times using a condom cannot be greater than the number of times having sex." Skip to W8.

If W1a is equal to 1 and W1b is not equal to 1 or W1a is greater than 1 and W3 is equal to 0, then skip to instruction before W12.

HIV-NEGATIVE PARTNERS (the green sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your **HIV-negative** male partner(s).

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

W9. **In the last 3 months:**

How many times did you have oral sex without a condom when your HIV-negative partner(s) ejaculated or came in your mouth?

— — —

998

Refuse to

Answer

W10. How many times did you have vaginal sex with your HIV-negative partner(s)? This would be with or without a condom and whether or not he/they ejaculated.

— — —

998

Refuse to

Answer

If W10 is equal to 0 or W10 is equal to "Refuse to Answer", then skip to instruction before W11.

W10a. How many of these times was a condom used?

— — —

998

Refuse to

Answer

If W10a is greater than W10 then the number of times using a condom cannot be greater than the number of times having sex." Skip to W10.

W11. How many times did you have anal sex with your HIV-negative partner(s)? This would be with or without a condom and whether or not he/they ejaculated.

— — —

998

Refuse to

Answer

If W11 is equal to 0 or W11 is equal to "Refuse to Answer", then skip to instruction before W12.

W11a. How many of these times was a condom used?

— — —

998

Refuse to

Answer

If W11a is greater than W11 then the number of times using a condom cannot be greater than the number of times having sex." Skip to W11.

If W1a is equal to 1 and W1b is not equal to 88 or W1a is greater than 1 and W4 is equal to 0, then skip to instruction before SUQ1.

WW1. Have you had any female sex partners in the last 3 months? By female sex partner, we mean women with whom you had oral sex.

0=No, 1=yes, 8=RTA. If NO or RTA, skip to S9Q1. If YES, go to WW2.

[like M15]

WW2. How many female sexual partners have you had in the last 3 months?

0-996=range, 998=RTA. If 0 or RTA, skip to S9Q1. If answer is 1 or greater, then go to WW3.

WW3. In the last 3 months, how many times did you have oral sex without a barrier, such as a female condom or dental dam?

PARTNERS OF UNCERTAIN HIV-STATUS (the green sheet)

The next group of questions asks about the sexual contacts you have had in the last 3 months with your male partner(s) whose **HIV status you were not sure of**.

Some of the next questions are about sexual behaviors where you or your partner may or may not have used a male or a female condom. When we ask about sex with a condom, we mean that a condom was put on or inserted **before** penetration and used **throughout** sex. For example, when we ask how many times a condom was used during intercourse, do not include times when penetration occurred without a condom, then a condom was put on and sex continued. Include those occasions when we ask you about intercourse without condoms.

W12. **In the last 3 months:**

How many times did you have oral sex without a condom when your partner(s) whose HIV status you were not sure of ejaculated or came in your mouth?

— — —

998

Refuse to

Answer

W13. How many times did you have vaginal sex with this/these partner(s) with uncertain HIV status? This would be with or without a condom and whether or not he/they ejaculated. — — —

998

Refuse to

Answer

If W13 is equal to 0 or W13 is equal to "Refuse to Answer", then skip to instruction before W14.

W13a. How many of these times was a condom used?

— — —

998

Refuse to

Answer

If W13a is greater than W13 then the number of times using a condom cannot be greater than the number of times having sex." Skip to W13.

W14. How many times did you have anal sex with partner(s) whose HIV status you were not sure of when his/their penis was in your rectum? This would be with or without a condom and whether or not he/they ejaculated.

— — —

998

Refuse to

Answer

If W14 is equal to 0 or W14 is equal to "Refuse to Answer", then skip to instruction before SUQ1.

W14a. How many of these times was a condom used?

— — —

998

Refuse to

Answer

If W14a is greater than W14 then the number of times using a condom cannot be greater than the number of times having sex."

Skip to W14a.

WW1. Have you had any female sex partners in the last 3 months? By female sex partner, we mean women with whom you had oral sex.

0=No, 1=yes, 8=RTA. If NO or RTA, skip to S9Q1. If YES, go to WW2.

[like M15]

WW2. How many female sexual partners have you had in the last 3 months?

0-996=range, 998=RTA. If 0 or RTA, skip to S9Q1. If answer is 1 or greater, then go to WW3.

WW3. In the last 3 months, how many times did you have oral sex without a barrier, such as a female condom or dental dam?

IX. Healthy Habits: Substance Use and Physical Activity

The following questions ask about some personal habits. Some questions are about your alcohol and drug use and others are about your physical activity. All of the questions ask about your behavior over the **last three months**. Please answer the questions as honestly as possible. Remember, nothing you tell us as part of this survey will ever be seen by anyone not part of this study nor will it ever be reported in any way that connects your name with what you answer.

BS9Q1. Pick the answer that best tells how often you drank alcohol in the **last 3 months**. By alcohol we mean wine, beer, or any kind of liquor. In the **last 3 months**, did you drink alcohol: (Choose one)

- | | |
|---|---------------------------------|
| 1 | Every day |
| 2 | 2 to 6 times a week |
| 3 | Once a week |
| 4 | 1 to 3 times a month |
| 5 | Less than once a month |
| 6 | Never->SKIP TO BS9Q3 |
| 8 | Refuse to Answer->SKIP TO BS9Q3 |

BS9Q2. If you are a **male**, how often did you drink **five or more drinks** of alcohol in a single day in the **last three months**? If you are a **female**, how often did you drink **four or more drinks** of alcohol in a single day in the **last three months**? (Choose one)

- | | |
|---|------------------------|
| 1 | Every day |
| 2 | 2 to 6 times a week |
| 3 | Once a week |
| 4 | 1 to 3 times a month |
| 5 | Less than once a month |
| 6 | Never |
| 8 | Refuse to Answer |

BS9Q3. From the list below, pick **up to 3 forms** of physical activity that you have done the most in the **past three months**.

- | | |
|----|--------------------|
| 01 | Jogging or running |
| 02 | Brisk walking |
| 03 | Biking |
| 04 | Yoga or Pilates |
| 05 | Basketball |
| 06 | Swimming |
| 07 | Aerobics |
| 08 | Dancing |

- 09 Rowing
- 10 Yard work
- 11 Soccer
- 12 Weight lifting
- 13 Other: _____
- 14 Have not exercised->SKIP TO BS9Q4
- 98 Refuse to Answer-.SKIP TO BS9Q4

For up to three items selected above

BS9Q3a. In the last 30 days how many days did you do *<above type of physical activity>*?

___ days (acceptable range 0 -30 days)

98 Refused to Answer

BS9Q4. Please check the box next to all those drugs that you sniffed, snorted, smoked, swallowed, or injected **in the last 3 months**. (Select all that apply)

- a ___ Marijuana or hashish
8 Refused to Answer
- b ___ Crack, freebase cocaine, or rock cocaine
8 Refused to Answer
- c ___ Powder cocaine (by itself)
8 Refused to Answer
- d ___ Heroin (by itself)
8 Refused to Answer
- e ___ Methamphetamine like Speed or Crystal Meth
8 Refused to Answer
- f ___ PCP or Angel Dust
8 Refused to Answer
- g ___ Opiates like Vicodin, Oxycontin, Dilaudid,
 Percocet, or Darvocet **not prescribed** by your doctor
8 Refused to Answer
- h ___ Street Methadone
8 Refused to Answer
- i ___ Tranquilizers or Barbiturates like Valium,
 Xanax, Librium, or Seconal
8 Refused to Answer
- j ___ Club drugs like Ecstasy, Roophies (Rohypnol),
 Special K/Vitamin K (Ketamine), or GHB
8 Refused to Answer
- k ___ Hallucinogens like LSD, Mushrooms, Peyote, or
 Mescaline
8 Refused to Answer
- l ___ Inhalants like glue, poppers, nitrous oxide
 (NO2)
8 Refused to Answer
- m ___ Viagra
8 Refused to Answer
- n ___ None->**SKIP TO BS10Q1**
8 Refused to Answer
- o ___ Other: _____
8 Refused to Answer

For each item answered "yes"→

BS9Q4a. In the last 30 days how many days did you use <substance>?

___ ___ days (acceptable range 0 -30 days) *If 0 ⇒ Skip to Question SUQ3b*

98 Refused to Answer

BS9Q4b. How about in the 30 days before that? How many days did you use <substance>?

___ ___ days (acceptable range 0 -30 days)

98 Refused to Answer

BS9Q4c. In the last 30 days about how many times per day did you use <substance>?

___ ___ times per day

98 Refused to Answer

X. Emotional Well-Being (SF-36)

You are getting there. Just three more short sections and you'll be done.

The next questions will ask you about how you have been feeling and how things have been **during the past 30 days**. As you read each statement, please give me the one answer that fits best with the way you have been feeling. Your choices are: All of the time, Most of the time, Some of the time, A little of the time, or None of the time?

BS10Q1. How much of the time during the past 30 days have you been a very nervous person?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q2. did you have a lot of energy?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q3. How much of the time during the past 30 days have you felt depressed?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q4. felt so down in the dumps that nothing could cheer you up?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q5. How much of the time during the past 30 days have you been a happy person?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q6. felt downhearted and blue?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

BS10Q7. How much of the time during the past 30 days have you felt calm and peaceful?

- 1 All of the time
- 2 Most of the time
- 3 Some of the time
- 4 A little of the time
- 5 None of the time
- 8 Refused to Answer

XI. SUBJECTIVE NORMS

The next section will ask about what three different groups of people think about whether or not people living with HIV should use condoms and tell their HIV status to partners. We will ask you about three different groups of people—your friends, your close family members, and your sex partners.

BS11Q1R.

First we'll ask about your friends.

How much do you agree or disagree with this statement [**slight pause**]:

Most of your friends think that people living with HIV should always wear a condom when having vaginal or anal sex.

- 1 Agree A Lot
- 2 Agree A Little
- 3 Disagree A Little
- 4 Disagree A Lot
- 8 Refuse to Answer

BS11Q2R

How much do you agree or disagree that:

Most of your friends think that people living with HIV should always tell their sex partner their HIV status before having vaginal or anal sex with them.

- | | |
|---|-------------------|
| 1 | Agree A Lot |
| 2 | Agree A Little |
| 3 | Disagree A Little |
| 4 | Disagree A Lot |
| 8 | Refuse to Answer |

BS11Q3R.

How about your family members?

How much do you agree or disagree that:

Most of your close family members think that people living with HIV should always wear a condom when having vaginal or anal sex.

- | | |
|---|-------------------|
| 1 | Agree A Lot |
| 2 | Agree A Little |
| 3 | Disagree A Little |
| 4 | Disagree A Lot |
| 8 | Refuse to Answer |

BS11Q4R

How much do you agree or disagree that:

Most of your close family members think that people living with HIV should always tell their sex partner their HIV status before having vaginal or anal sex with them.

- | | |
|---|-------------------|
| 1 | Agree A Lot |
| 2 | Agree A Little |
| 3 | Disagree A Little |
| 4 | Disagree A Lot |
| 8 | Refuse to Answer |

BS11Q5R

How about your sex partners?

How much do you agree or disagree that:

Most of your sex partner(s) think that people living with HIV should always wear a condom when having vaginal or anal sex.

- | | |
|---|-------------------|
| 1 | Agree A Lot |
| 2 | Agree A Little |
| 3 | Disagree A Little |
| 4 | Disagree A Lot |
| 8 | Refuse to Answer |

BS11Q6R

How much do you agree or disagree that:

Most of your sex partner(s) think that people living with HIV should always tell their sex partner their HIV status before having vaginal or anal sex with them.

- | | |
|---|-------------------|
| 1 | Agree A Lot |
| 2 | Agree A Little |
| 3 | Disagree A Little |
| 4 | Disagree A Lot |
| 8 | Refuse to Answer |

F1S11Q7. In general, how important or unimportant is it to you what other people think you should do? Is it:

- | | |
|---|----------------------|
| 1 | Not at all important |
| 2 | Somewhat important |
| 3 | Very important |
| 4 | Extremely important |
| 8 | Refused to Answer |

That's all the questions we have for you. Thank you so much for your time

XII. Demographics

We are just about at the end of our questions. The last few questions will help us better understand some of the other information you've already told us.

AGE

BS12Q1. How old are you?

— — —

998 Refuse to Answer

ETHNICITY

BS12Q2. What is your **primary** race or ethnic identification? (Choose one)

- | | |
|---|--------------------------------|
| 1 | Black/African American |
| 2 | Hispanic/Latino |
| 3 | White, not of Hispanic origin |
| 4 | Asian/Pacific Islander |
| 5 | American Indian/Alaskan Native |
| 6 | Another Race/Ethnicity |
| 7 | Mixed Race |
| 8 | Refused to Answer |

EMPLOYMENT STATUS

BS12Q3a. At this time, are you:

- 1 Working full-time->**SKIP TO BS12Q5**
- 2 Working part-time-> **SKIP TO BS12Q5**
- 3 Not working
- 8 Refused to Answer-> **SKIP TO BS12Q5**

BS12Q3b. Are you:

- 1 Retired
- 2 Laid off from a job temporarily
- 3 Unemployed with disability
- 4 Unemployed but don't have disability
- 5 Working in the home without pay
- 8 Refused to Answer

HEALTH INSURANCE

BS12Q4. What kind of health insurance do you have now? (Check all that apply)

- ☐ Medicaid
- ☐ Medicare
- ☐ Veteran's Administration
- ☐ Private insurance or HMO (Blue Cross and Blue Shield, Kaiser, etc.)
- ☐ None
- ☐ Other
- ☐ Refused to Answer

LIVING ARRANGEMENT

BS12Q5a. **Who** do you live with now? (Check all those that apply)

- 1 Alone
- 2 Spouse or partner
- 3 Children
- 4 Parent(s)
- 5 Sibling(s)
- 6 Other adult relatives (grandparents, cousins)
- 7 Friends or roommates
- 8 Refused to Answer

BS12Q5b. **Where** do you live at this point in time? (Choose one)

- 1 In a house or apartment that you rent
- 2 In a house or apartment that you own
- 3 In a family member's house or apartment
- 4 In another person's house or apartment (who is not a family member)
- 5 Halfway house or treatment center
- 6 Homeless shelter
- 7 Motel, hotel, or boarding house
- 8 Other: _____
- 98 Refused to Answer

BS12Q5c. **How long** have you lived there? Is it:

- 1 More than 2 years-> **SKIP TO BS12Q7**
- 2 More than 1 year but less than 2 years **SKIP to BS12Q7**
- 3 More than 6 months but less than 1 year
- 4 A few months, but not more than 6
- 5 Less than 1 month
- 8 Refused to Answer

BS12Q5d. **In the past year**, how many times have you moved from one place to another place?

- 1 Moved 1 time
- 2 Moved 2 times
- 3 Moved 3-4 times
- 4 Moved 5 or more times
- 8 Refused to Answer

RELATIONSHIP STATUS

BS12Q6. How would you describe your relationship status at this point in time?

- 1 Single, not living with a partner
- 2 Single, living with a partner
- 3 Married
- 4 Separated
- 5 Divorced
- 6 Widowed
- 7 Other: _____
- 8 Refused to Answer

SEXUAL IDENTITY

BS12Q7. Do you now identify as: (Choose one)

- | | |
|---|-----------------------|
| 1 | Straight/Heterosexual |
| 2 | Gay/Homosexual |
| 3 | Bisexual |
| 4 | Other |
| 5 | Not sure |
| 8 | Refused to Answer |

EDUCATION

BS12Q8. What is the **highest level** of education you have completed? (Choose one)

- | | |
|----|--|
| 1 | No formal education |
| 2 | Did not graduate from high school |
| 3 | High school graduate or GED |
| 4 | Some college/AA degree/technical school training |
| 5 | College graduate (BA/BS) |
| 6 | Some graduate school |
| 7 | Master's degree |
| 8 | Doctorate/Medical degree/Law degree |
| 98 | Refused to Answer |

INCOME

BS12Q9a. **During the last 12 months**, what was your **total income** from all sources? (Choose one)

- | | |
|---|----------------------|
| 1 | \$10,000 or less |
| 2 | \$10,001 to \$20,000 |
| 3 | \$20,001 to \$40,000 |
| 4 | \$40,001 to \$60,000 |
| 5 | \$60,001 to \$80,000 |
| 6 | Over \$80,000 |
| 8 | Refused to Answer |

INCOME SOURCE

BS12Q9b. **During the last 12 months**, where did you **mainly** get your income? (Check all the **MAIN** sources of your income that apply)

- | | |
|---|----------------------------|
| — | A job |
| — | Unemployment |
| — | Welfare, food stamps, AFDC |
| — | VA Benefits |
| — | Disability or SSI |
| — | Spouse or sexual partner |
| — | Other family |
| — | Friends |
| — | Alimony or child support |
| — | Sex work |
| — | Selling drugs |

- Hustling (petty theft, shoplifting, panhandling, scams,
etc.)
- Other: _____
- Refuse to Answer

Thank you so much for your time!

APPENDIX 4: Bootstrapping Code in SAS

Mediation Test for a Two-Level Model

```
libname foo 'h:\chris\temp';
/*****
/* DATAIN the input SAS data set
/* DV the final outcome variable name
/* X the independent variable name
/* M the mediator variable name
/* CVS list of control variable names
/* NBOOT the number of bootstrap iterations
*****/
%macro zu(datain,dv,x,m,cvs,nboot,outdata);
/* get the id variable values URN */
proc freq data=&datain noprint;
    tables urn/out=_table_(keep=urn);
run;
/* bootstrap the ids */
proc surveyselect data=_table_ out=_boot_ m=urs rate=1 reps=&nboot noprint
outhits;
run;
/* add ID */
data _boot_;
    set _boot_;
    id=_n_;
run;
/* delete _table_ */
proc datasets;
    delete _table_;
run;
quit;
/* merge with the original data */
proc sort data=&datain
    out=ss(keep=urn vnum &dv &x &m &cvs);
    by urn vnum;
run;
proc sort data=_boot_ out=_boot_(rename=(urn=urn1));
    by urn;
run;
proc sql;
    create table xx as
    select *
    from _boot_ o, ss j
    where (o.urn1=j.urn);
quit;
run;
proc sort data=xx out=xx;
    by replicate id vnum;
run;
/* delete _boot_ */
proc datasets;
    delete _boot_;
run;
quit;
```

```

/* model */
ods listing close;
/* create the macro variables XX which is the first 20 characters of X */
/* and MM which is the first 20 characters of M */
data _null_;
    call symput("xx",put("&x",20.));
    call symput("mm",put("&m",20.));
run;
/* X vs M model */
ods listing close;
proc genmod data=xx;
    class id;
    by replicate;
    model &m=&x &cvs;
*   repeated subject=id;
    ods output parameterestimates=_m_(where=(parameter="&xx")
                                         keep=replicate parameter estimate);
run;
/* DV vs X and M model */
proc genmod data=xx;
    class id;
    by replicate;
    model &dv=&x &m &cvs/dist=negbin link=log;
*   repeated subject=id ;
    ods output parameterestimates=_y_(where=(parameter="&mm")
                                         keep=replicate parameter estimate)

    convergencestatus=_conv_;
run;
ods listing;
/* merge estimates and convergence status and form the product */
data _estimates_;
    merge _m_(drop=parameter rename=(estimate=alpha))
          _y_(drop=parameter rename=(estimate=beta))
          _conv_;
    by replicate;
    ab=alpha*beta;
    if status=0;
run;
proc univariate data=_estimates_;
    var ab;
    histogram ab;
run;
/* get the mean and standard deviation of AB */
proc means data=_estimates_ noprint;
    var ab;
    output out=_estimate_(drop=_type_ _freq_) n=n nmiss=nmiss mean=ab
std=stderr;
run;
/* do the z test */
data _estimate_;
    set _estimate_;
    z=ab/stderr;
    OneTailedProbz=(1-probnorm(abs(z)));
    Probz=2*onetailedprobz;
run;
/* print */
proc print data=_estimate_ noobs;

```

```

var n nmiss ab stderr z probz onetailedprobz;
run;
/* if the &OUTDATA option is specified, create that data set */
%if ("&OUTDATA" ^= "") %then %do;
    data &outdata;
        set _estimates_;
    run;
%end;
/* delete some data sets */
proc datasets;
    delete _estimate_ xx _conv_ ss _estimates_ _m_ _y_;
run;
quit;
%mend;
*Macros;
options mprint mlogic;

*_test1_ will be a new dataset for Dose-se-TRB;
%zu(foo.sexactivemi, unsafe sex, mminutescum, Self_efficacy_mean_cent,
Motivation_mean_cent _cocaine_yn HS MoreHS SPNS_cat
phoneproportion Age _HasMain Site2 Site3, 1000, _test1_);

*_test2_ will be a new dataset for Sess-se-TRB;

%zu(foo.sexactivemi, unsafe sex, numsesscum, Self_efficacy_mean_cent,
Motivation_mean_cent _cocaine_yn HS MoreHS SPNS_cat
phoneproportion Age _HasMain Site2 Site3, 1000, _test2_);

*_test3_ will be a new dataset for Dose-se-UAVI;

%zu(foo.sexactivemi, UAVI, mminutescum, Self_efficacy_mean_cent,
Motivation_mean_cent _binge_drink _cocaine_yn HS MoreHS _diag_years SPNS_cat
phoneproportion SexPref2 SexPref3 viralload_new Age _HasMain Site2
Site3, 1000, _test3_);

*_test4_ will be a new dataset for Sess-se-TRB;

%zu(foo.sexactivemi, UAVI, numsesscum, Self_efficacy_mean_cent,
Motivation_mean_cent _binge_drink _cocaine_yn HS MoreHS _diag_years SPNS_cat
phoneproportion SexPref2 SexPref3 viralload_new Age _HasMain Site2
Site3, 1000, _test4_);

proc datasets memtype=catalog;
    delete gseg;
run;
quit;

proc contents data=_conv_;
run;

proc freq data=_conv_;
    tables status;
run;

proc print data=_y_;
run;
%macro zu(datain, dv, x, m, cvs, nboot);

```

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