

FACTORS ASSOCIATED WITH SAFE-SEX BEHAVIORAL INTENTION
IN PEOPLE LIVING WITH HIV/AIDS

By

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Dedicated to Marcie, Ben, and Emery

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TABLE OF CONTENTS

	Page
DEDICATION.....	iii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES.....	x
 Chapter	
I. Introduction.....	1
Statement of the Problem.....	1
Purpose and Aim of the Study.....	3
Research Questions.....	3
Aim One.....	3
Aim Two.....	4
Significance of the Issue and Need for Study.....	5
Significance to Society.....	5
Significance to Health.....	6
Significance to Nursing.....	8
II. Literature Review and Theoretical Framework.....	11
Theoretical Constructs Associated with Safe Sex Behavioral Intention.....	11
Theoretical Models.....	21
Prospect Theory and Message Framing in Healthcare.....	21
Theory of Planned Behavior.....	24
Synthesis of Prospect Theory and Theory of Planned Behavior.....	26
Study Framework.....	28
III. Methodology.....	33
Research Design and Assumptions.....	33
Description of Research Setting.....	33
Sample and Sampling Plan.....	34
Data Collection Methods.....	36
Procedures.....	36
Instruments.....	36
General Data Analysis.....	42
Data Analysis Specific to Research Questions.....	44
Sample Size and Power.....	44

IV. Findings.....	45
Sample Characteristics.....	45
Demographic Characteristics.....	45
Descriptive Summaries of Study Instrument Scores.....	46
Findings Related to Aim One.....	54
Findings Related to Aim Two.....	59
V. Discussion.....	67
Sample Characteristics.....	67
Findings Specific to Study Questions: Aim One.....	69
Depressive Symptoms and Safe Sex Behavioral Intention.....	69
Impulsivity and Safe Sex Behavioral Intention.....	71
Overall Psychological Adjustment and Safe Sex Behavioral Intention.....	72
Condom Use Self-Efficacy Related to STD Concerns and Safe Sex Behavioral Intention.....	72
Condom Use Self-Efficacy Related to Relationship Concerns and Safe Sex Behavioral Intention.....	73
Findings Specific to Study Questions: Aim Two.....	75
Safe Sex Messages focused on Personal Health and Safe Sex Behavioral Intention.....	75
Safe Sex Messages Focused on Relationship Concerns and Safe Sex Behavioral Intention.....	76
Hierarchical Regression Model.....	77
Summary of Overall Findings.....	79
Critique of Study Designs and Methods.....	82
Study Strengths.....	82
Study Limitations.....	83
Implications of the Study for Nursing and Clinical Practice.....	86
Recommendations for Future Research.....	89
Summary.....	91
Appendix	
A. Conceptual Framework.....	93
B. Instruments.....	95
C. Timeline for Dissertation Completion.....	102
REFERENCES.....	103

LIST OF TABLES

Table

1. Concepts of Interest.....	37
2. Study Variable Distribution and Transformation.....	43
3. Characteristics of Study Sample.....	46
4. Instrument Sample Scores and Internal Consistency Measure.....	46
5. Comparison of BIS Brief (8) Scores Among Study and Reference Groups.....	47
6. Comparison of PAS P Scores Among Study and Reference Groups.....	48
7. Categorization of Sample PAS P Scores by Likelihood of Concerning Findings.....	48
8. MSPS Net Scores and Frame X Content Summary Scores.....	50
9. Independent Variable Inter-Correlation Matrix (N = 150), Pearson's <i>r</i> and (<i>p</i> -values). <i>Italics</i> indicate inverted variable.....	53
10. Summaries of Unadjusted and Adjusted Associations of Depressive Symptoms with Safe Sex Intention.....	54
11. Summaries of Unadjusted and Adjusted Associations of Impulsivity with Safe Sex Intention.....	55
12. Summaries of Unadjusted and Adjusted Associations of Overall Psychological Adjustment with Safe Sex Intention.....	56
13. Summaries of Unadjusted and Adjusted Associations of Condom Use Self-Efficacy Related to Personal Health with Safe Sex Intention.....	57

14. Summaries of Unadjusted and Adjusted Associations of Condom Use Self-Efficacy Related to Relationship Concerns with Safe Sex Intention.....	58
15. Summaries of Unadjusted and Adjusted Associations of Preferences for Gain or Loss Framed Messages Related to Personal Health with Safe Sex Intention.....	59
16. Summaries of Unadjusted and Adjusted Associations of Gain-Framed and Loss-Framed Messages Regarding Personal Health with Safe Sex Intention.....	60
17. Summaries of Unadjusted and Adjusted Associations of Preferences for Gain or Loss Framed Messages Related to Relationship Concerns with Safe Sex Intention.....	61
18. Summaries of Unadjusted and Adjusted Associations of Condom Use Self-Efficacy Related to Gain-Framed and Loss-Framed Relationship Messages.....	62
19. Summary of Results from Hierarchical Multiple Linear Regression of Net Health and Relationship Messages on Safe Sex Behavioral Intention, Controlling for Demographic and Affective Characteristics.....	64
20. Summaries of Unadjusted and Adjusted Associations of all Study Variables Including Specific Gain-Frame and Loss-Frame Message Scores With Safe Sex Behavioral Intention.....	66

LIST OF FIGURES

Figure	Page
1. Conceptual Framework: Theory of Planned Behavior.....	93
2. Conceptual Framework: Association of psychological adjustment factors, self-efficacy, and message framing preference related to health concerns or relationship risks with safe sex behavioral intention.....	94

CHAPTER 1

INTRODUCTION

The intent of this research was to examine associations among depressive symptoms, impulsivity, overall psychological adjustment, self-efficacy, safe sex message framing preferences, and safe-sex behavioral intention in patients with human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS). For the period 2008 – 2011, the incidence of new HIV infections in the United States averaged 44,982 per year (CDC, 2011). These data raise the possibility that current safe-sex messages delivered in clinical settings are not fully effective. Depressive symptoms, impulsivity and low levels of self-efficacy have all been associated with an increased risk of unprotected sex (Alvy et al., 2011; Newville & Haller, 2010; Safren, Reisner, Herrick, Mimiaga, & Stall, 2010). If associations between these variables and safe sex behavioral intention (employed here as an alternative to self-report of sexual behavior) were established, a feasible strategy for customizing an individual's safe sex messages could potentially be developed to promote safe sex behaviors more effectively.

Statement of the Problem

At the end of 2010, the prevalence of HIV in the United States was approximately 1.14 million cases (CDC, 2013b). Each of these cases represents great personal (Audet, McGowan, Wallston, & Kipp, 2013; Kylma, 2005; Reif, Mugavero, et al., 2011) and social costs (Gebo et al., 2010). Horizontal transmission of the virus occurs when secretions (semen, vaginal secretions, saliva, blood) from an infected person come into direct contact with mucosal surfaces (vaginal, rectal, oral) of the uninfected person (CDC, 2013a). Since 2003, the Centers for Disease Control and Prevention (CDC) have recommended regular communication of HIV

prevention messages to individuals infected with HIV(Gilliam & Straub, 2009), but HIV incidence rates have been relatively stable over the past several years (CDC, 2011).

There are many potential reasons for the lack of effectiveness of safe sex messaging. One of these might be that multiple sources of information, often incorrect, available to individuals in our dynamic, open society make unprotected sex seem safer (i-base, 2010). In addition to a plethora of unedited text freely available via the Internet, sub-cultures and communities of like-minded individuals are recognized as often curating their own behavioral standards (Factor, Kawachi, & Williams, 2011).

In terms of HIV, data show that, relative to the general population, there is a disproportionate burden of mental illness and psychological adjustment challenges in people living with HIV/AIDS (Alvy et al., 2011; Hirshfield et al., 2008; Mills et al., 2004). While current CDC recommendations for ongoing care of persons with HIV include behavioral screening for consistent condom use at each clinical encounter (CDC, 2013c), these recommendations do not extend to tailoring condom use messages to the individual's psychological profile.

Research focused on possible relationships between individual factors and consistency in condom usage has emphasized the uniqueness of interventions versus the replicability of successful experiments across different samples. Further, inconsistencies in the amount of time defined for successful outcome (one week, one month, three months) have further obscured the clarity of results across samples (Gallagher & Updegraff, 2012). There is a gap in knowledge about how to effectively improve safe-sex messages given to every patient at every visit, as evidenced by the ongoing incidence of approximately 45,000 new HIV infections per year in the U.S (CDC, 2011).

Summary. Clinicians are guided by science and federal guidelines to provide certain disease prevention messages to patients at every visit, from smoking cessation to condom use. However, clinicians cannot force patients to adopt any behavior. Given the tremendous personal and societal costs of HIV treatment, it is reasonable to explore any and all options available to clinicians to improve the efficiency and effectiveness of their safe sex communication efforts.

Purpose and Aims of the Study

The purpose of the study was to investigate psychological adjustment factors related to message framing preferences and their associations with intentions to engage in safe sex. There were two aims of the study: 1) to examine the strength and direction of possible associations of psychological adjustment characteristics (depressive symptoms, impulsivity, overall psychological adjustment, and condom use self-efficacy) with safe sex behavioral intention, and 2) to examine the strength and direction of preference for gain-framed or loss-framed safe sex messages focused on personal health or relationship concerns with safe sex behavioral intention.

Research Questions

Aim One

1. Is there an association between depressive symptoms and safe sex behavioral intention in people living with HIV/AIDS?

Hypothesis 1: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of depressive symptoms are associated with lower levels of behavioral intention for safe sex..

2. Is there an association between impulsivity and safe sex behavioral intention in people living with HIV/AIDS?

Hypothesis 2: In people living with HIV/AIDS, after controlling for demographic variables (age,

race, gender, years with HIV), higher levels of impulsivity are associated with lower levels of behavioral intention for safe sex.

3. Is there an association between overall psychological adjustment and safe sex behavioral intention in people living with HIV/AIDS?

Hypothesis 3: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), overall psychological adjustment is associated with higher levels of behavioral intention for safe sex.

4. Is there an association between self-efficacy related to concerns about sexually transmitted diseases (STD) transmission and safe sex behavioral intention in people living with HIV/AIDS?

Hypothesis 4: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-efficacy regarding STD transmission concerns are associated with higher levels of behavioral intention for safe sex.

5. Is there an association between self-efficacy about relationship concerns and safe sex behavioral intention in people living with HIV/AIDS?

Hypothesis 5: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-efficacy about relationship concerns are associated with higher levels of behavioral intention for safe sex.

Aim Two

6. Is there an association between preference for gain-framed or loss-framed safe sex messages related to personal health and safe sex behavioral intention in people living with HIV/AIDS?

Due to the complete lack of published literature available on this association, proposing a directional hypothesis is not warranted. One aim of this study is to explore this association.

7. Is there an association between preference for gain-framed or loss-framed safe sex messages

related to relationship issues and safe sex behavioral intention in people living with HIV/AIDS?

Due to the complete lack of published literature available on this association, proposing a directional hypothesis is not warranted. One aim of this study is to explore this association.

8. Is there an association between a preference for safe-sex message frame, relevant message context (personal health or relationship) and safe-sex behavioral intention in people living with HIV/AIDS?

Due to the complete lack of published literature available on this association, proposing a directional hypothesis is not warranted. One aim of this study is to explore this association.

Significance of the Issue and Need for Study

Significance to Society.

Incidence and prevalence of HIV in the United States. According to estimates published by the Centers for Disease Control and Prevention (CDC), there were 1.14 million Americans living with HIV/AIDS at the end of 2010 (CDC, 2011). For the past several years, the national incidence rate has remained steady at approximately 15/100,000 (approximately 50,000) infections per year, with the southeastern US having the highest regional burden of disease with 20.9/100,000 new infections annually (CDC, 2011). Approximately 18% of those infected with HIV in the US are unaware of their diagnosis. Across the US, only 66% of those known to have HIV are linked to care, 37% are retained in care, 33% are prescribed antiretroviral therapy (ART), and only 25% are virologically suppressed (CDC, 2012).

Costs of HIV care. The annual cost of HIV/AIDS in the US in terms of direct care is estimated to be \$12.6 billion (Chesson et al., 2011; Owusu-Edusei et al., 2013). Costs per patient year are estimated at \$19,912 (IQR \$11,405 - \$22,626) (Gebo et al., 2010). At the national level, the average financial cost of providing lifetime care for an HIV/AIDS patient is \$379,668

(SAMSA, 2012). The federal Ryan White HIV program budget was \$2.305 billion in FY2011, with \$885 million of this amount allocated to medication costs (Johnson, 2011).

Significance to Health.

Burden of living with HIV/AIDS. The burden of living with HIV/AIDS is profound. Painful peripheral neuropathy (Simpson et al., 2006), hypogonadism (Kibirige & Ssekitoleko, 2013), hypothyroidism (Beltran et al., 2003), and elevated rates of (Safren et al., 2010) are all commonly seen sequelae of HIV infection. Management of HIV requires lifelong daily adherence to antiretroviral therapy (ART) and quarterly visits to an HIV specialty provider to monitor disease progression. In addition, the treatment for HIV creates additional health risks, as exposure to ART has been strongly associated with increased risks of new-onset diabetes mellitus (Brown et al., 2005), coronary artery disease (Triant, Lee, Hadigan, & Grinspoon, 2007), and renal diseases (Gupta et al., 2005).

Social Marginalization. The biological, psychological, and existential impact of social marginalization is a well-researched topic, and well-documented as profoundly affecting people living with HIV/AIDS. In the US, the prevalence of HIV/AIDS has shifted from strictly men who have sex with men (MSM) populations to communities of the poor, people of color, and women - populations that also struggle with social marginalization (Niyonsenga, Trepka, Lieb, & Maddox, 2013; Pence et al., 2007; Reif, Whetten, Wilson, & Gong, 2011). Associations have been demonstrated between increasing levels of perceived stigma and patient loss to care (Pecoraro et al., 2013), poor adherence with HAART (Wasti, Simkhada, Randall, Freeman, & van Teijlingen, 2012), increased levels of depression, and poorer HIV disease outcomes. Participants in a study of HIV-related stigma (N=221) revealed that 41% affirmed that they were treated negatively after having disclosed their HIV status (Venable, Carey, Blair, & Littlewood,

2006). Further, in a multi-step regression model that controlled for income, employment status, and time since HIV diagnosis, the β for depression (as measured by the CES-D) was 0.38, with a cumulative R^2 of 0.22, $p < 0.01$. Of note, depression was inversely related to treatment adherence ($R^2 = 0.16$, $p < 0.01$) (Vanable et al., 2006). In one qualitative study, 75% of 32 study participants reported using self-isolation as a tool to avoid feeling stigma and discrimination because of their HIV status (Audet et al., 2013).

Working along related lines, the World Health Organization (WHO) has championed the concept of social determinants of health. The WHO has identified ten key psychosocial and environmental factors that directly impact health. These include stress, social exclusion, unemployment, lack of social support, addiction, and lack of access to good food and transportation (WHO, 2003). In the southeastern US, individuals with HIV/AIDS are more likely than the general population to suffer from these social burdens that compromise their ability to achieve health (Reif, Whetten, et al., 2011; SSAC, 2008). The concept that these forces act in a negatively synergistic manner, rather than individually, is important for contextualizing the psychosocial burden of PLWHA in the southeastern US.

Significance to Nursing.

The care provided by nurses includes the design and implementation of therapeutic modalities for the patient and their support systems. Our model of care is fundamentally holistic; nurses practice from a vantage point that explicitly recognizes the biopsychosocial nature of our patients. In few areas of human expression does the necessity of the biopsychosocial model come into sharp relief as it does in the diagnosis, treatment, and prevention of sexually-transmitted diseases.

Nurses are uniquely trained and socialized to walk confidently into these charged environments and provide care to all persons encountered without applying personal judgment to anyone. Successful STD treatment includes not only the correct diagnosis and treatment of disease, but also the ability to provide an open environment where the patient can ask questions and remain open to learning new information that will hopefully lead to better decisions in the future. These skills, long part of the broader culture of advanced practice nursing, should provide APRNs with the basic tools to efficiently and effectively incorporate message framing into their existing models of care.

History of nursing in HIV care. There is a long and rich history of nurses playing a central role in the provision of care to people with HIV/AIDS (California, 2007). Nurses have managed their chronic illness care, coordinated treatment, customized treatment regimens to patient needs, and educated patients on effective ways to treat disease-related problems and side effects. This holistic approach to patient care has been clearly demonstrated in the responses of scores of nurses to HIV/AIDS patients since the beginning of the epidemic.

Professional Statements and Ethics. In addition to this rich and vibrant history, nursing's professional code of conduct underlies and guides ethical aspects of healthcare as service. Provision One of the Code of Ethics for Nurses with Interpretative Statements states that "the nurse, in all professional relationships, practices with compassion and respect for the inherent dignity, worth, and uniqueness of every individual, unrestricted by considerations of social or economic status, personal attributes, or the nature of health problems" (ANA, 2001, p. 3).

Promoting healthy sexual practices is within the scope of nursing care. Provision Three of the Code of Ethics for Nurses with Interpretative Statements asserts that "the nurse promotes,

advocates for, and strives to protect the health, safety, and rights of the patient” (ANA, 2001, p. 6).

Nursing research. Research in this area is a strategic policy objective of many nursing organizations, such as the Association of Nurses in AIDS Care (ANAC). Founded in 1987, ANAC’s mission is to promote the professional development of nurses providing care to PLWHA and to concurrently promote the health of PLWHA. Of four policy priorities identified for 2013, Priority Three states: “Support for the dissemination and implementation of evidence based and scientifically driven HIV prevention programs” (ANAC, 2013, p. 1). The nursing honor society, Sigma Theta Tau, has partnered with the Association of Nurses in AIDS Care to provide grant funding for HIV-related research.

Summary. Because of the enormous psychosocial, functional, and financial costs of living with HIV/AIDS, continued high incidence rates of HIV infection are disturbing and highlight the need for more effective safe-sex communication between clinicians and patients. Providing HIV-infected individuals with safe-sex counseling at every clinical visit is a practice endorsed by the Centers for Disease Control and Prevention (CDC, 2013c). This recommendation, however, makes no formal allowance for patient factors that may impact message receptivity and patient agency toward recommended goals.

In response to the known gap between current safe-sex messaging and desired health outcomes in this population, alternative approaches to safe-sex messaging deserve exploration. To date, little, if any, research has been done to explore the possible associations among depressive symptoms, impulsivity, psychological adjustment, self-efficacy and safe-sex behavioral intention. Nurses have a long and important history in regards to the HIV epidemic,

and our training and professional standards equip us for excellence in the care of individuals with HIV and other STDs.

CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Many factors have been proposed as either moderators or mediators of human sexual behavior. Based on associations in the literature, depression (Alvy et al., 2011), impulsivity (Newville & Haller, 2010), overall psychological adjustment (Kelly, St. Lawrence, & Brasfield, 1991), self-efficacy (Widman, Golin, Grodensky, & Suchindran, 2013), and message framing (Garcia-Retamero & Cokely, 2011) may all influence patient safe sex behavioral intention. In order to better appreciate these relationships, an exploration of each of these constructs will precede a review of the construct of safe sex behavioral intention. An explication of the conceptual framework for this study, with roots in Prospect Theory and the Theory of Planned Behavior, follows the discussion of study constructs.

Theoretical Constructs Associated With Safe Sex Behavioral Intention

Depressive Symptoms. Depressive symptoms include depressed mood, anhedonia, feelings of worthlessness, impaired cognitive ability, changes in appetite, and insomnia or hypersomnia. When present for an extended period of time, these symptoms may be cited as clinical evidence that a patient has a diagnosis of depression (Nolen-Hoeksema, 2011). Published studies estimate the prevalence of depression in the HIV-positive community as two to three times higher than the rates of depression in the general population, with estimates of between 22% and 32% of HIV-positive persons being diagnosed with depression (Bing et al., 2001). Results from an unpublished study in the author's HIV clinic revealed that 59% of 239 participants screened at elevated risk for depression (Nash, 2012). In that study, depressive symptoms were inversely correlated with general self-efficacy ($r_s = -.44, p < .001$).

Several studies support the link between increased levels of depression and increased unsafe sex (Alvy et al., 2011; Corless et al., 2012b; DiMatteo, Lepper, & Croghan, 2000; Lauriola, Russo, Lucidi, Violani, & Levin, 2005; Pence, Miller, Whetten, Eron, & Gaynes, 2006). One study of Caucasian MSM (N=662) found that 16% reported increased sexual interest while depressed, and 14% affirmed less concern for safe sex while depressed (Bancroft, Janssen, Strong, & Vukadinovic, 2003). While none of these studies examined the role of safe sex intention (versus behavior), we are assuming that intention does precede behavior, based on the Theory of Planned Behavior. In this study, the term “depressive symptoms” was used to categorize the symptoms listed above, as it may not be appropriate (as is done in some studies; i.e., Alvy, et. al. 2011) to give a patient a clinical diagnosis of depression based on their responses to one two-item instrument, with no provider interaction.

Impulsivity. Impulsivity is another psychological factor that may influence safe sex behavioral intention. Despite largely uniform practices around high-level aspects of socialization (concepts such as delayed gratification and impulse control) in American society, there are individuals who grow to adulthood unable to control their impulses. Impulsivity in the general population is both common (17% of a sample of 34,653 adults) and also linked to many Axis I and Axis II disorders (Chamorro et al., 2012). In the context of individuals with HIV/AIDS, a sense of personal recklessness has been linked with an increased likelihood of unsafe sexual encounters (Newville & Haller, 2012). To date, impulsivity has not been examined with message-framing preference in the literature. Because impulsivity has been associated with risky sex (Alvy et al., 2011; Corless et al., 2012b; DiMatteo et al., 2000; Lauriola et al., 2005; Pence et al., 2006), it seemed reasonable to investigate its relationship to message framing and safe sex behavioral intention, since intention precedes behavior.

Overall Psychological Adjustment. The construct of overall psychological adjustment is a measure of the adaptability of an organism to its environment. This adaptability is assessed in terms of equilibrium between an organism's needs and an environment's resources and challenges (Encyclopaedia Britannica, 2016). Maladaptive behaviors, including depressive symptoms and impulsivity, may reflect an underlying mal-adjustment to one's environment.

To date, there have only been a few studies examining the role of this construct in regards to safe sex. Data from a study of levels of psychological distress, an indicator of psychological maladjustment, in Australian men who have sex with men (N=250) revealed that approximately 41% of the participants had a past history of a sexually transmitted infection (Gibbie, Mijch, & Hay, 2012), which would imply inconsistent condom usage. In this study, safe sex behaviors were not used as outcome variables. Evidence does suggest that psychological adjustment factors may be associated with an individual's sense of self-efficacy (Bandura, 2004; Ironson & Hayward, 2008; Van'T Riet, Ruiters, Werrij, & De Vries, 2008), which may in turn be associated with their safe sex intention.

Self-Efficacy. Self-efficacy is a focused form of perceived control that reflects a person's interest in change and their willingness to overcome adversity to achieve specific goals (Luszczynska, Scholz, & Schwarzer, 2005). Lower levels of self-efficacy have been consistently associated with general high-risk behaviors, including sexual risk-taking (Pulerwitz, Amaro, De Jong, Gortmaker, & Rudd, 2002; Romero, Galbraith, Wilson-Williams, & Gloppen, 2011; Swendeman, Ingram, & Rotheram-Borus, 2009). Lower levels of self-efficacy are also linked to greater levels of depression and impulsivity, factors linked with less safe sex behavior (Alvy et al., 2011; Corless et al., 2012a; DiMatteo et al., 2000; Lauriola et al., 2005; Pence et al., 2006; Williams, Clarke, & Borland, 2001). Conversely, higher levels of condom-use self-efficacy are

associated with higher rates of condom usage (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Barkley Jr & Burns, 2000; Widman et al., 2013).

Self-efficacy has been associated with various risk behaviors related to HIV and with disease outcomes in this patient population. Romero and colleagues (2011) reviewed 54 research studies related to HIV prevention among African American youth by examining correlates of five sexual risk behavior outcomes. In multiple studies, these reviewers discovered that greater self-efficacy was associated with later age at first sex, less unprotected sex, and fewer sexual partners (Romero et al., 2011).

Findings from an unpublished study in the candidate's HIV clinic (Nash, 2012) revealed statistically significant inverse associations with general self-efficacy for psychological adjustment characteristics related to a history of unsuccessful attachment relationships, a focus on somatic complaints, negative affect, lack of interest in social interaction, and chronic anger. The correlation of the overall psychological adjustment score in this sample of 239 HIV-infected men and women with the general self-efficacy score was -0.47 ($p < .001$). This correlation was consistent with findings in other studies (Alvy et al., 2011; Kamen et al., 2013; Klein, 2014) examining self-efficacy and psychological adjustment.

Message Framing. Message framing refers to the process of intentionally communicating either the benefits of undertaking a proposed activity (gain-framed messaging) or the costs of not undertaking a proposed activity (loss-framed messaging) (Rothman & Salovey, 1997). Messaging is commonly used to encourage a wide range of behaviors related to good health and chronic disease management. Encouragement of lifestyle changes, including improvements in diet and increased exercise, form the cornerstone of recommended therapies to reduce and/or reverse chronic illnesses including hypertension, Type II diabetes, hyperlipidemia,

and obesity (Berenbaum & Latimer-Cheung, 2014; Gollust, Niederdeppe, & Barry, 2013; Grady, Entin, Entin, & Brunye, 2011; Jones, Sinclair, Rhodes, & Courneya, 2004). The CDC's Prevention for Positives program was launched in 2003 to focus on safe sex messaging to minimize transmission of HIV in high-risk populations. A review of intervention studies launched in response to this CDC initiative revealed that most studies did not address message framing preferences, but attempted to counsel and educate participants using a variety of risk reduction strategies (Gilliam & Straub, 2009).

To date, only one published study has assessed the role of message framing in decreasing risky safe sex behavior in HIV-infected patients. This study was conducted across six HIV clinics in California (N=585). Among subjects in the loss-frame arm with at least two sexual partners at baseline, there was a significant reduction in unprotected anal or vaginal intercourse across the 90-day study period ($p = 0.03$). Interestingly, there were no significant effects found for participants in the gain-frame arm or participants with only one partner at baseline. Condom use was assessed via self-report, and this was acknowledged as a limitation of the study (Richardson et al., 2004).

Relative to health messages that individuals can enact on their own, safe-sex messages involve the actions and choices of two individuals. Unlike the choice to undergo a mammogram, colonoscopy or PAP smear, or use sunscreen outdoors, two people have to make decisions in a real-time, interactive environment prior to intercourse. Decisions about condom use are unlike most other health decisions, in that they are undertaken by a dyad versus an individual, and there are immediate consequences to condom use decisions that are not present in other health behaviors. Asking a potential sexual partner to use a condom to prevent the spread of STDs

might also inadvertently send a message to that potential sexual partner that one actor in the dyad is concerned that the other has an STD, thus risking the relationship (Rothman & Salovey, 1997).

Accordingly, the authors of one study created gain-framed and loss-framed messages around both relationship and personal health risks associated with condom usage and asked study participants (undergraduate students) to assess both the importance and relative convincing power of these statements. The authors hypothesized that relationship risks would be perceived as greater than health risks, and that loss-framed messages would be more effective than gain-framed messages in addressing relationship concerns. Health concerns, linked more directly to prevention behaviors, were hypothesized as being more influenced by gain-framed messages. As predicted, gain-framed messages about the health benefits of condom usage were preferred to loss-framed messages, and loss-framed messages about the relationship risks of unprotected sex were preferred to gain-framed messages ($p=.015$, $d=.035$; Kiene, Barta, Zelenski, and Cothran (2005b).

A second experiment from the same study explored the effect of issue involvement, i.e., commitment to a relationship, on message frame preference in this sample. Consistent with Rothman and Salovey (1997), these authors hypothesized that Message Type X Frame interactions would be stronger among subjects with higher levels of relational involvement regarding the practice of condom use. The Message Type X Frame X Involvement interaction was significant ($p=.013$). Further, post hoc analyses revealed that high-involvement individuals (those whose involvement score was ≥ 1 standard deviation above the mean score) ranked relationship loss messages as more convincing than relationship gain messages ($p< .01$, $d=.47$) (Kiene, Barta, Zelenski, & Cothran, 2005a).

In order to further explore these findings, the candidate, working in conjunction with Susan Kiene, PhD, the first author of the study, developed The Message Style Preference Survey (MSPS). This new instrument uses 12 gain-framed and loss-framed safe sex statements (six gain/six loss) related to relationship threats and 12 gain-framed and loss-framed safe sex statements (six gain/six loss) related to personal health risks related to unsafe sex. Preliminary data from the MSPS in the candidate's HIV clinic suggested that individuals displayed likely different median values in their responses to messages that addressed relationship issues related to safe sex versus personal health concerns related to safe sex (Wilcoxon signed rank test, $Z = -4.962, p < .001$) (Huck, 2012). This finding is consistent with the results of the Kiene, et. al. study.

There is also contrary evidence questioning links between message frame and behavioral intention. In a 2012 meta-analytic review (Gallagher & Updegraff, 2012) of 189 effect sizes from 94 studies (five of which were safe sex studies that utilized behavioral intention as a dependent variable), researchers found that, across all effect sizes assessing behavior as an outcome ($N=52$), gain-framed messages were more likely than loss-framed messages to encourage desired health behaviors ($r = .083, p = .002$), but the significance of this association did not hold when the dependent variable was intention ($N=77$). One possible explanation for these findings would be the wide variety of behaviors over which intention or behavior was assessed. One could argue, for example, that there are significantly different levels of risk between condom use and dietary choices. The uniquely dyadic nature of sexual behavior intention decisions should also be taken into account when comparing results to behaviors that can be undertaken in isolation, i.e, dietary improvements, exercise, smoking cessation, and prevention of skin cancer via sunscreen use.

Summary. Depression and impulsivity have been linked to either message framing preference or risky sexual behavior. Depression has been linked to general message framing preference such that individuals with a positive affect preferred loss-framed to gain-framed messages. Impulsivity has been positively correlated with risky sexual behavior in several studies, and we are assuming, consistent with the Theory of Planned Behavior, that intention precedes behavior. The association between overall psychological adjustment and safe sex intention has not been previously explored; however, there are indirect linkages mediated by self-efficacy. Several studies have demonstrated associations between self-efficacy and risky sex behaviors for HIV patients in different environments.

Message framing strategies have been used in many health campaigns, with the underlying framework based on the work of Rothman and Salovey (1997). In this framework, disease prevention messages are viewed as relatively non-threatening and thereby best stimulated with gain frame messages. In contrast, disease detection messages may be perceived as more threatening, and are best stimulated by loss-framed messages. Decisions about condom use fall into a unique category of health communications because two people instead of one individual make the decision to use a condom with intercourse. There is theoretical support for the assertion that discussing condom use with a potential partner may introduce unintended assumptions regarding honesty, integrity, and trust into the relationship. In this population, condom use is often related to intimacy (Campbell et al., 2014; Golub, Starks, Payton, & Parsons, 2012). This observation is based on the fact that, in the population of men who have sex with men, the CDC recommends that condoms be used with all insertive sexual activity (CDC, 2013c). In light of this institutional, public health standard, among men who have sex with men, the choice to not use barrier protection with insertive sexual activity is perceived as an expression that the sexual

partner is trusted and that worries about transmission of STDs are not of primary concern (Golub et al., 2012). In addition to evidence in the literature, the candidate's patients regularly report condom use with casual partners and no condoms used with primary partners. As mentioned, preliminary data from the candidate's HIV clinic suggested that patients might be more sensitive to condom use messages related to relationship risks than they were to similar messages related to personal health concerns. Evidence from the literature (Kiene et al., 2005a; Richardson et al., 2004) suggests that relationship concerns can be a barrier to safe sex behavioral intention and therefore merited assessment in this study.

Safe Sex Behavioral Intention. "Intention" is defined by Merriam-Webster's Dictionary as "the thing that you plan to do or achieve : an aim or purpose" ("intention", 2015).

Behavioral intention, therefore, can be construed as a specific behavior that an individual aims or plans to achieve in order to realize a specific goal. Intention has been correlated with behavior in many studies, including studies exploring human sexual behaviors (Kasprzyk, Montano, & Fishbein, 1998). Safe sex behavioral intention, therefore, may be construed as the specific intention to use condom barrier protection with insertive sexual activity with a given partner. Safe sex behavioral intention is not gender-specific. In any sexual encounter, either person or both parties may intend for themselves or their partner to use condom barrier protection.

Self-report of condom use behaviors over a defined period of time is commonly used in safe sex behavioral research. Self-report of the behaviors related to the consumption of tobacco, alcohol, and illicit substances are commonly utilized in substance abuse research. There are concerns, however, regarding the accuracy of these data. For example, a 2006 study found that individuals marginalized by their race (African American versus Caucasian) and their lower socioeconomic status assumed that a positive self-presentation to their healthcare provider would

enhance their health outcomes (Malat, van Ryn, & Purcell, 2006). It is not unreasonable to extrapolate from this finding that some individuals may choose to report condom usage rates in line with what they think their healthcare provider wants to hear from them versus actual rates of use/non-use.

Further evidence to support response bias is found in a study published in 1995. In a longitudinal study of 598 men and women attending community STD clinics in Baltimore Maryland, 23% of men and 19% of women reported using condoms “all the time”. Using new incident STDs as markers of condom non-adherence, the authors reported that 36% of men who reported “always” using a condom presented with STDs at baseline. These were treated per standard of care, yet 15% of these “always” male condom users had new STDs at 30 days from the start of the study. Among the women, 18% of the “all the time” condom users had an STD, and 24% of the woman had new incident STDs at 30 days (Zenilman et al., 1995). Findings from these studies call the accuracy of self-reported condom usage into question.

Safe sex behavioral intention has demonstrated significant correlations with self-reported condom use in many studies and is a more suitable variable for a cross-sectional study (Albarracin et al., 2001). In a 1998 meta-analysis of data from 18 studies, researchers report an overall correlation of $r^2 = .44$ between behavioral intention and condom use. In the same study, the authors cite meta-analyses not related to sexual behavior that found correlations of $r^2 = .45$ and $r^2 = .53$ between behavioral intention and the explored behaviors (Sheeran & Orbell, 1998).

Summary. Given that the direct observation of human sexual behavior outside of controlled research conducted with consenting adult participants is neither morally nor operationally feasible, researchers interested in sexual health messaging must search for the next best alternative. Many safe sex behavior (condom use) studies rely on an individual’s post-hoc

self-report. There are concerns with relying on self-report, including the potential conflation of intention and behavior, the subject's desire to please the interviewer, and the vagaries of human memory. Although safe sex behavioral intention (SSBI) may also be affected by response bias, the literature demonstrates that SSBI is a theoretically grounded, robust alternative to self-reported condom use.

Theoretical Models

Prospect Theory and Message Framing in Healthcare. The theoretical foundations of this study are rooted in Prospect Theory and the Theory of Planned Behavior. Other theoretical frameworks that were considered included Social Cognitive Theory, the Transtheoretical Model, and the Transactional Model of Stress and Coping. While each of these theories offered unique insights into the question at hand, none of them better accommodated this study than Prospect Theory and the Theory of Planned Behavior. The reasons for these selections will be reviewed in the following section.

Many studies on health communications research over the past decade has been based on the application of Prospect Theory to prevention of illness and detection of health behaviors. Rothman and Salovey (1997) observed that the task of promoting healthy behaviors should be straightforward, as people should be able to receive a message about a health risk (i.e., smoking) and act to minimize that risk. In order to explore methods for improving responses to health messages, Rothman and Salovey looked to the field of economics and specifically to Prospect Theory, the most widely used alternative to rational choice models in economics (Barberis, 2013).

In order to understand Prospect Theory, one must first become acquainted with a well-known actor in many rational choice models in economics, *homo economicus*. This “straw man”

acts in every situation to maximize his outcome in the most rational way possible (Kliver, Frazier, & Haidt, 2014). In a world populated by *homo economicus*, individuals act rationally to maximize their own self-interests. Health would be a highly sought-after goal, as health is always less costly than disease. Maintaining significant relationships would also be a highly valued objective for many individuals. *Homo economicus* acts as we would act were we purely rational creatures. There are many cases, however, when the hypothesized decisions of *homo economicus* fail to predict human behavior (Kliver et al., 2014). Prospect Theory was created to illuminate processes around some of the seemingly irrational aspects of human decision-making.

Rothman and Salovey (1997) established the link between Prospect Theory and health messaging in their seminal paper, “Shaping Perceptions to Motivate Healthy Behavior: the Role of Message Framing.” As discussed above, Prospect Theory predicts responses to framed messages based on an assessment of risk. Rothman and Salovey differentiate between public health risks and risks associated with personal health behaviors. The former (when posed in research questions) are hypothetical, quantitative, dichotomous, and precise, while the latter are not. It is critical to note that Rothman and Salovey argued that personal health messages are not received without bias into a purely objective decision-making environment. Rather, they argued that personal health behavior messages, once received, are contextualized by the recipient’s personal history (cancer history in the family, for example) and social norms (sexual behaviors in a subculture, for example). In the realm of personal health decisions, Rothman and Salovey proposed that there is a significant difference between health behaviors designed to prevent disease (application of sunscreen at the beach) and health behaviors that have the potential to detect disease (PAP smear, mammogram, colonoscopy, HIV screening). Disease detection may be perceived as more of a threatening activity because of what might be uncovered, rather than a

helpful activity which might facilitate disease intervention at earlier versus later stages of illness. In this context, prevention behaviors are stimulated by gain-framed messages because of their perceived lower risk and detection behaviors are stimulated by loss-framed messages because of their perceived higher risk (Rothman & Salovey, 1997).

Evidence from this study of the effect of framed messages on risky sex behaviors in HIV-infected individuals (Richardson et al., 2004) is aligned with Rothman and Salovey's application of Prospect Theory to health messaging (1995). Findings from Richardson, et. al. (2004) demonstrated that loss-framed messages were more effective at reducing risky sex than gain-framed messages. One explanation offered for this finding is that loss-framed messages illuminate what might happen in the future if a specified behavior is not undertaken today, while gain-framed messages are focused on the future benefit of action in the present. This is a critical point because, as Richardson, et. al. (2004), point out, the fact that a patient already has HIV may alter their perception of risks related to sexual behaviors. Anecdotally, HIV-infected individuals often choose to have unprotected sex with other HIV-infected individuals. This pattern might indicate that these individuals are no longer threatened by the risk of acquiring HIV. However, this does not explain the behavior of HIV-infected individuals who have unprotected sex with uninfected partners, thus leading to 45,000 new infections every year.

Richardson, et. al. (2004) also suggested, based on the fact that their findings were specific to participants with more than one sexual partner, that perhaps loss-framed messages are more effective when they are presented to individuals who do not have to enter into relationship dialogue in order to engage in sexual behavior. However, Kiene's study (2005) presented evidence that concerns about protecting a relationship are critical to conversations about safe sex. Perhaps there is a baseline level of transactional dialogue that accompanies most consensual sex

acts; if that is true, that would invalidate Richardson et. al.'s assertion. On the other hand, the evidence (approximately 45,000 new infections annually) does suggest that some HIV-infected individuals may not be communicating their disease state with all sexual partners.

Theory of Planned Behavior. Over time, health researchers have proposed many theoretical models to explain how individuals receive, process, and act on health-related information. One of the most frequently used models is the Theory of Planned Behavior (TPB) (Ajzen, 1991), a modification of the Theory of Reasoned Action (TRA) introduced by Fishbein and Ajzen in 1975. The Theory of Planned Behavior (Appendix A, figure 1) asserts that health behaviors are best predicted by behavioral intention, which is in turn predicted by attitudes, perceived control, and subjective norms regarding the behavior in question. Attitudes are composed of behavioral beliefs and an individual's evaluation of behavioral outcomes, which corresponds to beliefs about the need and effectiveness of condom use in this study. Subjective norms are composed of the normative beliefs of an individual's peers, which corresponds to concerns about partner expectations, and an individual's motivation to comply with a health behavior. Perceived control, measured in this study as self-efficacy, also affects intention in this model. Self-efficacy related to confidence in relationships and ability to withstand rejection from a partner due to requesting condom use are relevant to this study.

Many studies have used the TPB as a theoretical framework; studies specifically related to condom use are reviewed here. In a cross-sectional study of 297 men attending a community seminar on AIDS education and reduction of risky sex behaviors, safe sex intention was significantly correlated with behavioral beliefs ($r^2 = .38, p < .001$), attitudes ($r^2 = .36, p < .001$), subjective norms ($r^2 = .22, p < .001$), and actual reported condom use ($r^2 = .31, p < .001$) (Cochran, Mays, Ciarletta, Caruso, & Mallon, 1992). Findings from another study also revealed

significant correlations between condom use intention and the following behaviors in a sample of homosexual undergraduate students: “talking with each new partner about safer sex” ($r = .2743$, $p < .05$), “using condoms during insertive anal sex” ($r = .5829$, $p < .0001$), and “using condoms during receptive anal sex ($r = .5498$, $p < .01$) (Fisher, Fisher, & Rye, 1995, p. 261).

In a large study ($N=686$) designed to assess the ability of the TPB to predict condom usage patterns in four high-risk groups (men who have sex with men (MSM), intravenous drug users, commercial sex workers, and multi-partnered heterosexuals), statistically significant correlations were found between model constructs, intention, and behavior. For anal sex with regular partner, attitude ($r=.53$, $p < .001$), social norms ($r =.29$, $p < .001$), perceived control ($r =.32$, $p < .001$), and behavioral intention ($r = .67$, $p < .001$) were all correlated with reported behaviors at Time 2. For anal sex with a casual partner, attitude ($r = .25$, $p < .05$), perceived control ($r = .21$, $p < .05$), and behavioral intention ($r = .25$, $p < .001$) were all correlated with observed behaviors at Time 2. For anal sex with a casual partner, the correlation between social norms and reported behavior was not significant (Kasprzyk et al., 1998). This pattern indicated that concern about casual partners’ expectations was not related to safe sex behavior, but concerns about primary partners’ expectations were related to safe sex behavior.

In a 2001 meta-analysis of 96 studies using the TRA/TPB to explore condom use rates, researchers found that, overall, reported condom use was significantly correlated with condom use intention ($r = .45$). Furthermore, intentions were significantly associated with attitudes ($r = .58$), which were associated with behavioral beliefs ($r = .56$). Intentions were also significantly associated with subjective norms ($r = .39$), which were associated with normative beliefs ($r = .46$). Perceived control was also significantly associated with condom use intention ($r = .45$) and

condom use ($r = .25$) (Albarracin et al., 2001). Studies supported the relationships hypothesized in the Theory of Planned Behavior model.

A 2014 experimental study compared changes in condom discussion and condom use among undergraduates exposed to interventions guided by the Theory of Planned Behavior, the Health Belief Model, or information only. When combined in a linear model, none of the constructs of the Health Belief Model were significantly associated with risky sexual behavior at baseline ($p = .701$). In contrast, a linear model based on the collected constructs of the TPB was found to be significantly associated with risky sexual behavior at baseline ($p < .001$). Individually, both attitudes ($p < .001$) and behaviors ($p < .001$) were significantly and inversely correlated to risky sexual behavior. In this study, behavioral intentions were significantly correlated with each of the components of the TPB: condom attitudes ($r = .409, p < .001$), subjective norms ($r = .359, p < .001$), perceived behavioral control ($r = .538, p < .001$), and self-efficacy ($r = .235, p < .001$) (Montanaro & Bryan, 2014).

Synthesis of Prospect Theory and the Theory of Planned Behavior. Prospect Theory has been applied to healthcare messaging for the past 20 years and has been the primary model for studying the effects of framing on health messages in many contexts. The basic tenets of the framework have been validated in numerous studies (Gallagher & Updegraff, 2012) and have been successfully applied to health messaging by Rothman and Salovey (1997). Prospect Theory recognized that decision-making is not a purely rational process. More importantly, Prospect Theory moved beyond this observation to provide a well-tested model to aid those seeking to motivate message recipients toward healthy goals.

Critically, Rothman and Salovey asserted that messages are processed in an environment with competing influences, such as an individual's level of personal engagement and social

norms. In this environment, a health message must be aligned with the recipient's internal processing milieu in order to influence behavioral intention. This observation had direct bearing on the framework designed for this study. Another finding from the literature with implications for this proposal was the observation from Latimer-Chung, et. al. (2012) that gain-framed messages might be more effective in patients with higher levels of self-efficacy, which is one of the theoretical constructs that was measured in this study.

The Theory of Planned Behavior is another framework with broad use in the literature (Albarracin et al., 2001). In this framework, behavioral intention is influenced by an individual's attitude about a health behavior, subjective norms about a behavior, and level of perceived control (self-efficacy) about that behavior. In this framework, behavioral intention is viewed as the necessary antecedent to actual behavior.

Both Prospect Theory and the Theory of Planned Behavior recognize the role of individual factors in decision-making processes. Both are attempts to explore the bases for decision-making in order to provide a usable framework for communicating messages that will achieve desired goals. These commonalities suggest that it might be possible to establish a satisfactory integration of the frameworks toward the goals of this project.

The Theory of Planned Behavior provides a multi-factorial framework that recognizes the variety of influences facing individuals as they form intention toward a desired behavior, including beliefs about safe-sex behaviors (attitudes), perceptions of partner expectations (social norms), and perceived control (self-efficacy). In addition, demographic factors, personality traits and individual differences that could be related to psychological adjustment can all affect attitudes, social norms, and perceived control (refer to Figure 1). Rothman and Salovey (1997) are explicit in their view that the context within which decisions are contemplated must be taken

into account by message senders. This is a natural point of theory integration, as Prospect Theory does not address the mechanics of an individual's decision-making context, and the Theory of Planned Behavior does not provide a mechanism via which movement toward intention might be predicted.

The theory that guided this study was based on the integration of Prospect Theory and the Theory of Planned Behavior (Appendix A, figure 2). Specifically, the framework inserts Rothman and Salovey's (1997) application of Prospect Theory to health messaging into the framework of the Theory of Planned Behavior, such that message framing preference, influenced by psychological adjustment, depressive symptoms, impulsivity, and self-efficacy, is a direct antecedent to safe-sex behavioral intention. This integration provides recognition that psychological forces may be associated with the assessment of a framed health message and also offers the possibility of leveraging message framing to affect intention.

Study Framework

The purpose of the study was to investigate psychological adjustment factors related to message framing preferences and their association with intentions to engage in safe sex. Several constructs reviewed in this proposal may influence reception of a framed safe sex message and may also affect safe sex intention directly. Several studies have demonstrated associations between depressive symptoms and an individual's level of engagement with their health, and studies have borne out the hypothesis that affect is protective (Keller & Lehmann, 2008; Keller, Lipkus, & Rimer, 2003). In other words, the preference of individuals with a more positive affect for loss-framed messages suggests that positive affect provides reassurance to the individual that they might consider bad outcomes when processing intentional alternatives without succumbing

to despair. Similarly, individuals with a more positive affect may be more inclined to pursue safe sex behaviors (Alvy et al., 2011; Mills et al., 2004).

Increased impulsivity has been repeatedly linked with increased risky sexual behaviors (Cyders et al., 2007; Deckman & DeWall, 2011; Klein, 2012; Pinkerton & Abramson, 1995; Whiteside & Lynam, 2001). Given this finding, it seems reasonable to examine possible connections between safe sex behavioral intention and impulsivity. Evidence also suggests that psychological adjustment factors may be associated with an individual's self-efficacy, or sense that they can achieve desired goals (Bandura, 2004; Ironson & Hayward, 2008; Van'T Riet et al., 2008).

Self-efficacy has also been associated with message frame preferences, with evidence suggesting that individuals with higher levels of self-efficacy have a higher tolerance for loss-framed health information (Gallagher & Updegraff, 2012; Werrij, Ruiter, Van 't Riet, & De Vries, 2011). These findings are consistent with Witte's Extended Parallel Process Model, which suggests that higher levels of self-efficacy allow individuals to process information from a cognitively-dominant versus a fear-dominated perspective (Witte, 1992). Higher levels of self-efficacy have also been shown to be linked to higher levels of safe sex intention (Hynie, MacDonald, & Marques, 2006; Montanaro & Bryan, 2014).

Providing HIV-positive patients with safe sex counseling at every clinical encounter is standard practice in HIV clinics (CDC, 2013c). The continuing high incidence and prevalence of HIV and other STDs is evidence that there is room for improvement in this arena. Current standards dictate that every patient receives the same message (use condoms with all insertive sexual activity) at every encounter, with no formal allowance for clinical practice factors that may be associated with message receptivity or patient agency toward recommended goals.

In response to this known gap between current health messaging and desired health outcomes, many customized educational and techniques strategies (largely time-intensive counseling and educational interventions) have been used to decrease risky sexual behaviors, and short term behavior changes have been documented (Gilliam & Straub, 2009). To date, little, if any, research has been done to explore the possible associations among psychological characteristics, self-efficacy, preferential receptivity to gain-framed or loss-framed safe sex messages, and safe sex behavioral intention.

In health behavior research, the Theory of Planned Behavior is widely used in studies of human sexual behaviors (Albarracin et al., 2001; Garcia-Retamero & Cokely, 2014; Montanaro & Bryan, 2014). In this model, an individual's attitude, subjective norms, and perceived control in a given situation all influence their behavioral intention, which is a predictor of subsequent behavior (Glanz, Rimer, & Viswanath, 2008). The inclusion of behavioral intention as an antecedent to behavior is of critical importance in this study, as we have presented findings suggesting that, while still imperfect, SSBI is a preferable dependent variable to reported condom use.

Key constructs from the theoretical framework are conceptually very similar to those of the TPB. Attitudes, composed of behavioral beliefs and evaluation of behavioral outcomes, are conceptually analogous to personal health concerns for which individuals may exhibit a message frame preference because safe sex messages may attempt to influence an individual's attitude toward behavioral intention by raising concerns about their health. In a similar fashion, subjective norms, composed of normative beliefs and motivation to comply, are conceptually analogous to relationship concerns that affect message frame preference because safe sex messages may adversely affect relationships. These beliefs and perceptions presumably

influence message receptivity and subsequent intention. Message framing preferences reflect input from both attitudes about the need for safe sex practices and perceived relational expectations (social norms).

Processing safe sex messages requires an assessment of the risk of either completing or ignoring recommended actions to enhance the likelihood of safe sex outcomes during sexual encounters. One of the multitude of models attempting to explain risk-related decision-making processes is Prospect Theory, which was originally proposed as an economic model (Tversky & Kahneman, 1981). The central tenet of Prospect Theory is that individuals are risk-averse when presented with potential versus actual gains and risk seeking when presented with potential versus actual losses. Prospect Theory has been widely applied to health messaging, utilizing Rothman and Salovey's framework, which forms the basis for the application of Prospect theory to the prediction of message framing preference. Relatively low risk behaviors are best encouraged by gain-framed messages. Disease prevention is viewed as being of lower risk than disease detection; therefore, gain-framed messages are preferred to encourage prevention behaviors. It is important to point out that, to date, linkages have only been established between message framing preference and behavior, as opposed to behavioral intention. However, consistent with the Theory of Planned Behavior, we are assuming that behavioral intention must be present for behavior to occur.

Rothman and Salovey hypothesized in their landmark article linking Prospect Theory with health messaging that condom use messages could be viewed as a threat to a relationship (Rothman & Salovey, 1997). Results from another study suggest that relationship concerns are significant in the context of condom use discussions and decisions (Kiene et al., 2005a). In a highly valued partnership, it is reasonable to assume that potential loss of the relationship is more

threatening than concerns about exposure to HIV and other sexually transmitted diseases. In these situations, loss-framed messages may more effectively address relational barriers to SSBI. The focus on relationship concerns is related to the Theory of Planned Behavior construct of subjective norms, reflected in message framing preference. Both types of concerns reflect concerns for the thoughts of others as one forms behavioral intention. The complete framework (Appendix A, figure 2) provides a visualization of the concepts outlined above.

The following foundational assumptions guided the author's approach to his phenomenon of interest:

1. Existing safe-sex messaging techniques are not fully effective in encouraging behaviors that minimize transmission of HIV virus.
2. Variations in the psychological adjustment characteristics used in this proposal do not fully account for variation in safe sex intention.
3. Other factors, such as message framing, which may contribute to variation in safe sex intention, deserve exploration.
4. The manner in which a message is communicated can affect motivation and intention related to safe sex behaviors.
5. Emotional states can affect message-framing preferences.
6. Intention precedes behavior.

CHAPTER III

METHODOLOGY

Research Design and Assumptions

This project was a cross-sectional, descriptive-correlational study. This approach facilitated maximizing participant confidentiality; there was no need to assign data identifiers or collect any demographics that would facilitate revealing any participant. Due to known stigma issues faced by HIV-infected individuals living in the Southeastern US (Pence et al., 2007), assurance of participant confidentiality was paramount. Additional advantages of this study design were feasibility and low cost. Disadvantages included the limitation of the study to English-speaking, literate subjects. Another limitation was that the dependent variable, safe sex behavioral intention, suffers from a fundamental inability to be accurately quantified.

Description of Research Setting

The Vanderbilt Comprehensive Care Clinic (VCCC) is the largest HIV clinic in the Southeastern US, and one of the largest in the nation. Demographics from 2014 revealed a clinic population of 3,125 patients with the following characteristics: 76% male, 23% female, and approximately 1% transgender. The vast majority of patients were between the ages of 25 and 64. Regarding race, 57% of all patients were Caucasian and 42% Black; 37% of female patients Caucasian and 61% of female patients Black. Fifty-eight percent of males stated route of transmission was sex with men, 88% of females endorse heterosexual activity as route of transmission of HIV.

In addition to its clinical mission, the VCCC is also an active research site. The clinic is utilized by the Vanderbilt University Medical Center's Division of Infectious Diseases Epidemiology/Outcomes research team and by the Vanderbilt AIDS Clinical Trials Center

(ACTC). Staff and patients are both comfortable with researchers and are notably helpful with the research process.

Sample and Sampling Plan

Nature and size of sample. For this study, the sample was composed of a convenience sample of 150 community-dwelling adult men and women infected with the HIV virus and coming to an HIV clinic for ongoing care.

Inclusion and exclusion criteria. The accessible population for this study were community-dwelling adults with HIV/AIDS who received care at the Vanderbilt Comprehensive Care Clinic. Subjects were recruited from patients presenting to the HIV clinic for regularly scheduled, ongoing clinical care. Inclusion criteria included: (1) 18 years of age or older, (2) HIV-positive, (3) English-speaking, (4) presenting to HIV clinic for regularly scheduled ongoing care. Rationale for inclusion criteria were based on the goal of attaining the best possible sampling of clinic patients with minimal disruption to the ongoing care delivered in clinic.

Exclusion criteria included: (1) patients presenting for care of acute physical and/or mental health needs, (2) non-English-speaking patients, (3) patients who state that they categorically refuse to use condoms during any sexual activity, and (4) patients endorsing active suicidality. Exclusion criteria (1) was based on the need to avoid compromising the care of acutely ill patients. Exclusion criteria (2) was implemented to minimize adverse impact on clinic flow by avoiding the time and costs associated with the provision of language line translation services for non-English-speaking patients.

Exclusion criteria (3) was implemented to minimize the risks of skewing study results. Statements in the Condom Use Self-Efficacy Scale Subscales 2 and 3, the Message Style Preference Survey, and the Sexual Risks Scale, Intention Subscale each referenced condom

usage. Inclusion of participants who categorically refused to use condoms would have skewed answers to those items. Exclusion criteria (4) was based on the inclusion of two questions related to suicidality on the Personality Assessment Screener (PAS). Had any potential study subject endorsed active suicidality, the interview would have immediately ended, the study RA would have remained with the patient at all times, and the study PI and/or assistant clinic manager would have been paged to the study room to activate existing clinic protocols for suicidal patients. Without this exclusion in place, patients actively contemplating suicide would have received delayed care. Further, affirmation of active suicidality toward the end of the scheduled interview would necessitate destruction of all data collected to that point, or statistical measures would have to be employed to address incomplete data sets.

Methods for subject recruitment. Written advertisements for the study were posted in all clinic exam rooms, as this was the standard for patient recruitment in the clinic. Clinic patients were accustomed to perusing the back of the exam room door while waiting to see their provider, and it is not uncommon for providers to be asked about new study flyers several times a day. At no time was patient made aware that the candidate was the Principal Investigator for the study.

Potential subjects were screened in a private room by the study Research Assistant. Individuals meeting inclusion criteria were invited to participate in the study, while those meeting exclusion criteria were thanked for their time and excused. Enrolled subjects were offered a \$10 gift card at the end of their interview as compensation for the time required to complete the study. The amount of the gift card was carefully considered to avoid being perceived as coercive. The goal of the card was to recognize and respect the time and consideration that subjects give to this study.

Strategies to ensure human subject protection. The project was approved by the Vanderbilt University Institutional Review Board (IRB) prior to initiating any data collection (Vanderbilt University IRB 150967). The IRB granted the study a Waiver of Documentation of Informed Consent by as an additional precaution to protect subject privacy. No patient identifiers were collected as part of this study, and only aggregate data were reported. Administration of all questionnaires was done in a quiet, secluded room to ensure participant privacy.

Data Collection Methods

Procedures. The study Research Assistant, acting under the training and direction of the candidate (Principal Investigator), personally conducted all aspects of study recruitment and completion. The Research Assistant met interested individuals alone in a private room for screening purposes. If exclusion criteria were met, the interview was terminated and the patient excused. If inclusion criteria were met, then the potential participant was offered the opportunity to sign a consent form. The optional nature of documentation of consent was explained as a method for protecting privacy. Prior to administration of the study instruments, basic demographics (non-identifiable) were collected. These included age at time of study, gender, race, and number of years the person has had HIV. Data were collected via iPad to ensure that participants had the privacy necessary to answer frank sexual questions without embarrassment. Once all data had been collected, participants were thanked for their participation in the study and given a \$10 gift card.

Instruments. Table 1 (below) lists the concepts of interest in the study, the instruments used to measure those concepts, the number of items for each instrument and the total number of scores that were collected from each participant.

Table 1. Concepts of Interest.

Concept	Instrument	Number of Items	Number of Scores
Depressive Symptoms	PHQ-2	2	1
Impulsivity	Barratt Impulsivity Scale-11 (Brief)	8	1
Overall Psychological Adjustment	Personality Assessment Screener (PAS)	22	1
Self-efficacy	Condom Use Self-efficacy Scale (subscales): 2) Relationship risks related to STD exposure subscale, 3) Partner's reaction to condom use subscale	6	2
Message framing preference for safe-sex messaging related to personal health	Message Style Preference Survey	12	1
Message framing preference for safe-sex messaging related to perceived relationship risk	Message Style Preference Survey	12	1
Safe-sex behavioral intention	Sexual Risks Scale: Intention Subscale	7	1
Total Items		67	
Total Scores			8

Depressive Symptoms. The Patient Health Questionnaire-2 (PHQ-2) (Appendix B, Instrument 1), which utilizes the first two questions of the Patient Health Questionnaire-9, has recently established itself as a diagnostic instrument whose sensitivity and specificity scores are satisfactory when compared to well-known, longer scales such as the Structured Clinical Interview Scale for DSM-IV (SCID) (Lowe, Kroenke, & Grafe, 2005; Phelan et al., 2010). In original testing, the PHQ-2 was demonstrated to have a sensitivity of 83% and a specificity of 90% for major depression (Kroenke, Spitzer, & Williams, 2003). Answers to the two items on the PHQ-2 are scored from zero to three, and the two answers are summed for a final score. A final score of three or greater yields the sensitivity and specificity scores cited above. Validation of this instrument was based on comparing PHQ-2 scores with diagnostic categories (major

depressive disorder, other depressive disorder, no depressive disorder) as assigned to 58 study participants whose depressive disorder status was assessed by a mental health professional (Kroenke et al., 2003). Cronbach's alpha was not reported in the original validation study.

In a study published in 2008, a group of researchers assessed the validity and reliability of both the PHQ-9 and PHQ-2 in a sample of adults living with HIV/AIDS in Western Kenya. The PHQ-9 is preferred in resource limited settings, and the hypothesis of these researchers was that the PHQ-2 would prove itself to be a valid screening tool for depression, as it is even more economical than the PHQ-9. In this study, sensitivity and specificity for the PHQ-2 were 85% and 95%, respectively for any depressive disorder, and 91% and 77% for diagnosing major depressive disorder. Cronbach's alpha in this study was 0.78 (Monahan et al., 2009). Based on these results, a single PHQ-2 score was used in this study.

Impulsivity. The Barratt Impulsiveness Scale (Appendix B, Instrument 2), currently in its 11th revision (BIS-11), is often used in research involving the concept of impulsivity. Originally published in 1959, this 30-item self-report inventory utilizes a four-point Likert scale. Factor analysis of the original version of the instrument suggested an underlying three-factor structure that has, over time, had significant influence over the study of impulsiveness. Within this three-factor structure, cognitive impulsiveness refers to a tendency to make quick decisions, motor impulsivity refers to a tendency to act without thinking, and non-planning impulsiveness refers to acting without forethought (Steinberg, Sharp, Stanford, & Tharp, 2013).

A 2013 study assessing the multi-factorial nature of the BIS-11 was used to develop a single-factor, eight-item instrument, the BIS-Brief, which had a Cronbach's alpha of 0.78. Community samples of two groups of participants (one with borderline personality disorder, which is strongly associate with impulsivity, and another with victims of adult domestic violence

were used to assess correlations between the BIS-11 and the BIS-Brief, which were found to be significant ($p < .001$) (Steinberg et al., 2013). For the purposes of this study, we utilized the summary score of the BIS-Brief rather than explore sub-scales available via administration of longer versions of this instrument. This choice was made to minimize subject burden.

Overall Psychological Adjustment. The Personality Assessment Screener (PAS) (Appendix B, Instrument 4) is a 22-item, self-administered screening instrument developed to identify potential concerns around ten domains of pathologies related to psychological adjustment (Morey, 1991). This instrument measures the level of specific behavioral traits that are linked to DMS-IV-TR diagnoses in the parent instrument, the Personality Assessment Inventory (PAI). Factor analyses of the PAI were utilized to identify both the domains and elements of the PAS.

The PAI is widely regarded as an innovative and powerful tool for the assessment of a broad range of clinically relevant psychopathologies. Unfortunately, it is not possible to administer an instrument of this depth and breadth in the context of a brief clinical encounter. The PAS was developed to meet the goal of clinical utility within the framework of diagnostic excellence established by the parent instrument. There is a small but growing body of literature exploring the utility of the PAS in settings of relevance to people living with HIV/AIDS (Gibbie et al., 2012; Porcerelli, Kurtz, Cogan, Markova, & Mickens, 2012).

The PAS uses a proprietary P score to express the likelihood that scores on this instrument are or are not reflective of clinically significant scores on the parent instrument, the PAI. The higher the PAS P score, the greater the likelihood that a given patient would have diagnosable psychological illnesses identified via administration of the full PAI. Total PAS P scores greater than or equal to 48 are indicative of emotional and behavioral problems, but this

assessment is not linked to any specific PAS domain (Morey, 1991). Cronbach's alpha scores from the 3 large samples used to construct the instrument area as follows (sample/N/alpha): community/1,000/.75, clinical/1,246/.79, college/1,051/.72 (Morey, 1991). For the purposes of this study, we used only the PAS total P score.

Self-efficacy. The Condom Use Self-Efficacy Scale (CUSES) (Appendix B, Instrument 3) was used to assess self-efficacy related to condom use in a sexual encounter. Published in 2000 by Barkley and Burns, this ten-item inventory features three distinct subscales, each identified via use of the original 28-item inventory in a sample of college students. The first subscale was not used for this study. The second factor focuses on the concern that advocating condom use calls the STD status of the potential sexual partner into question. This factor has a Cronbach's alpha of 0.83. A third factor focuses more generally on how a participant would expect a potential sexual partner to react to a discussion of condom use, and the Cronbach's alpha for this factor was 0.66 (Barkley Jr & Burns, 2000). For this study, we utilized the second and third subscale scores (relationship risk, partner reaction).

Message Style Preference Survey. While the construct of message framing has been used in a variety of research settings, there are currently no standardized tools available for use in research about message framing and sexual health behaviors. The use of study-specific health messages in the literature is a hindrance to improving our knowledge in this arena.

Kiene et. al.'s (2005) condom use message framing rubric has been discussed in another section of this proposal. The central thrust of this rubric is that messages about condom use fall neither into their strictly prevention or strictly detection behaviors, since there are relationship risks associated with condom use that do not apply to individual behaviors. Her study demonstrated that perceived risks to relationship as well as to personal health were valid frames

for condom use messages. Accordingly, this author contacted Dr. Kiene and secured permission to use statements from her research in this study.

Based on Dr. Kiene's work, the candidate created the Message Style Preference Survey, a set of six pairs of gain-framed and loss-framed statements addressing relational messaging about condom use and six pairs of gain-framed and loss-framed statements addressing personal health and condom use. In response to the question "how likely is each of these statements to convince you to use a condom?", each statement is ranked on a 4-position Likert scale (0-3), consisting of the choices "not at all", "very little", "somewhat", and "to a great extent". Scores are computed by summing responses to each set of 12 gain-framed and loss-framed messages (personal health concerns and relationship concerns), and then subtracting the gain-frame total from the loss-frame total. This yields a net score indicating a participant's relative preference for the gain framed or loss framed messages. Additionally, individual scores for each of the four statement categories (health gain, health loss, relationship gain, relationship loss) were obtained in order to assess the strength of associations among each message type/frame with safe sex intention

In the pilot study of that measure for this research, those 24 statements (Appendix B, Instrument 5) were administered to a convenience sample of 60 HIV clinic patients (all from the Vanderbilt Comprehensive Care Clinic). Cronbach's alpha for the group of relationship risks statements was 0.86, and was 0.92 for the group of personal health statements. Cronbach's alpha for relationship gain statements was 0.90, and 0.68 for relationship loss statements. For the health concern statements, Cronach's alpha was 0.89 for health gain statements and 0.79 for health loss statements. Reliability of the MSPS was not assessed, and a further limitation of this instrument is that its use has been limited to a single, pilot study. The Message Style Preference Survey demonstrated sufficient internal consistency to be used in the candidate's research.

Safe Sex Behavioral Intention. Safe sex behavioral intention was measured with the seven-item Intention subscale of the Sexual Risks Scale (SRS) (Appendix B, Instrument 6), which was published by Dehart and Birkimer in 1997. A pilot study and two follow-up studies of undergraduate students were used to develop and select items for the final 38-item SRS instrument, which was not administered in this study. Cronbach's alpha for the seven-item behavioral intention subscale used in this study was 0.80 (Dehart & Birkimer, 1997).

General data analysis

All instrumentation for this study was electronically presented such that participant responses could be gathered via iPad touch screens, using Vanderbilt REDCap software. Accordingly, there was no paper instrumentation used for this study, and no transcription of data from paper to an electronic format was required. Survey instruments were programmed to prohibit blank answers to any question, thereby assuring 100% response rate. Once data collection was completed, data were exported from REDCap to Microsoft Excel, where time and date stamp fields were deleted. This file was then imported directly into SPSS Version 22 for data analysis.

Demographic variables of age and years with HIV were assessed using median and interquartile range calculations, due to the skewed nature of this data. All answers to the question of participant gender were either "male" or "female", and were reported via counts and percents. Data regarding participant race was collected in accordance with federal guidelines, including options for American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, Black or African American, and White. Based on the fact that 147 of 150 participants assessed themselves as either "Black or African American" or "White", data for the three outlier values were grouped into these two groups, thus facilitating dichotomization of the variable "Race".

Calculations of each variable’s mean, median, interquartile range, and skewness were completed as a first step in data analysis. Results for several of the study variables were skewed and required commonly accepted transformation techniques (Tabachnick & Fidell, 2007) in order to meet standards of normalcy (see Table 1 below). Once all variables were normalized via transformation, bivariate correlations among the independent variables were calculated using Pearson’s Product Moment Coefficients.

Table 2. Study variable distribution and transformation.

Variable	Distribution (skewed or normal)	Transformation technique used to achieve normal distribution
Depressive symptoms	Skewed	Square root
Impulsivity	Normal	
Condom use self-efficacy related to STD concerns	Skewed	Inverted, lg10
Condom use self-efficacy related to relationship concerns	Skewed	Inverted, Square root
Overall Psychological Adjustment	Normal	
Message Style Preference Survey – Health Messages Net Score	Normal	
Message Style Preference Survey – Relationship Messages Net Score	Normal	
Message Style Preference Survey – Health Gain Messages	Skewed	Inverted, lg10
Message Style Preference Survey – Health Loss Messages	Skewed	Inverted, Square root
Message Style Preference Survey –Relationship Gain Messages	Skewed	Inverted, lg10
Message Style Preference Survey – Relationship Loss Messages	Skewed	Inverted
Safe Sex Behavioral Intention	Skewed	Inverted, lg10

Data analysis specific to research questions

Questions 1-7. Bivariate linear regression was used to assess the direction and strength of the relationship between safe sex behavioral intention and each of the study variables. For the unadjusted model, Pearson's Product Moment coefficients and p -values among each of the demographic covariates, safe sex behavioral intention, and each of the psychological and message framing variables were calculated. For the adjusted models, linear regression was used to assess the direction and strength of association among the four demographic variables and each of the psychological, message framing, and safe sex behavioral intention variables. Standardized coefficient beta and p -values were reported

Question 8. Hierarchical multiple regression was used to control for demographic variables (age, race, gender, years infected with HIV), depressive symptoms, impulsivity, self-efficacy, and overall psychological adjustment in order to most clearly illuminate the relationships of message frame with safe sex behavioral intention.

Sample size and power

The most complex analysis included 12 independent variables. For generation of stable regression coefficients, a sample of at least 120 was required (10 cases per variable). Given the unknowns of how prevalent missing data might be, a sample of 150 was proposed and obtained. Given that sample size, regression coefficients as small as 0.23 representing 5% shared variance with the dependent variable would be statistically significant (80% statistical power, $\alpha=0.05$); therefore meaningful associations could be detected.

CHAPTER IV

FINDINGS

Sample Characteristics

A cross-sectional, convenience sample of 150 study participants was successfully recruited for this study. All participants were patients of the Vanderbilt Comprehensive Care Clinic presenting to the clinic for routine HIV care. Data were collected via iPads while patients waited to be seen by their HIV provider, during September and October, 2015. This method of data collection was not disruptive to the normal flow of the busy HIV clinic where the study was conducted.

Demographic characteristics

Demographic characteristics of the study sample are presented below (Table 3). The majority of participants were male (60.7%), with approximately equal representation of black and white racial groups. The median age of the sample was 47.5 years, and the median number of years living with HIV was 12. Of the 150 participants, 109 (72.7%) stated that they always used condoms with sex.

Table 3. Characteristics of Study Sample (N=150).

		Count (%)	Median	Min	Max	IQR (25-75)
Race	Black	79 (52.7)				
	White	71 (47.3)				
Gender	Male	91 (60.7)				
	Female	59 (39.3)				
Condom Use	Always	109 (72.7)				
	Sometimes	41 (27.3)				
Age (Years)			47.5	21	72	36-54
Years with HIV			12.0	1	33	6-20

Descriptive summaries of study instrument scores

A summary of scores on each of the study instruments, as well as each instrument’s Cronbach’s Alpha, is provided in Table 4. A brief review of scores for each instrument follows.

Table 4. Instrument Sample Scores and Internal Consistency Measure (N=150)

Instrument (# of items)	Median	Min	Max	IQR (25-75)	Cronbach’s Alpha
PHQ-2 (2)	1.0	0	6	0-3	.62
BIS-Brief (8)	16.0	8	27	13 - 20	.75
PAS (P-score reported) (22)	69.6	1.7	99.9	31 – 90	.74
CUSES Subscale 2 (3)	10.0	0	12	8 - 12	.90
CUSES Subscale 3 (3)	9.0	0	12	8 – 12	.76
MSPS Health Focus (12)	1.0	-12	10	0-3	.90
MSPS Relationship Focus (12)	4.0	-6	12	1-7	.85
SRS-Intention Subscale (7)	25.0	4	28	21 - 28	.85

Patient Health Questionnaire-2 (PHQ-2). Scores on this instrument (Kroenke et al., 2003) range from zero to six, with scores of three or greater indicating that the participant suffers from depression. In this sample, 39 participants (26%) had a score of three or greater.

Barratt Impulsiveness Index (BIS-Brief (8)). Scores on this instrument (Steinberg et al., 2013) range from zero to 32, with higher scores indicating a greater likelihood of impulsive

behavior. In addition to the descriptive summaries of the sample scores in Table 4, summaries of sample scores from three very different populations collected during instrument validation are also presented in Table 5. With the exception of Domestic Violence Perpetrators (N=111), the scores from the current sample were statistically significantly different from those samples. Scores from the current sample were higher than the normal sample, yet lower on average than those from the Borderline Personality and Refractory MH samples ($p < 0.001$, see Table 5).

Table 5. Comparison of BIS Brief (8) Among Study and Reference Scores.

Sample	N	Mean (SD)
Current Sample: HIV-positive community-dwelling adults	150	16.3 (4.4)
BIS (8) Community Sample: Normal*	128	13.5 (3.1)
BIS (8) Community Sample: Borderline Personality Disorder*	68	21.8 (4.2)
BIS (8) Domestic Violence Perpetrators	111	16.4 (4.6)
BIS (8) Adolescent In-patient Refractory Mental Health Diagnoses*	92	20.6 (5.2)

Statistically significantly different from the current sample ($p < 0.001$)

Personality Assessment Screener (PAS). The PAS (Morey, 1991) uses a proprietary P score to express the likelihood that scores on this instrument are or are not reflective of clinically significant scores on the parent instrument, the Personality Assessment Inventory (PAI). Total PAS scores equal to or greater than 48 are considered indicative of emotional and behavioral problems. In addition to the descriptive summaries of the sample scores in Table 4, summaries of sample scores from three very different populations collected during instrument validation are also presented in Table 6. In all cases, scores from the current sample were statistically significantly different from those samples. Scores from the current sample were higher than both the Community and College Student samples, but lower than the clinical sample ($p < 0.001$, see Table 6).

Table 6. Comparison of PAS P Scores among Study and Reference Groups.

Sample	N	Mean (SD)
Current Sample: HIV-positive community-dwelling adults	150	60.7 (31.8)
PAS Community Sample*	1,000	37.8 (29.3)
PAS Clinical Sample (affective disorders, alcohol abuse, personality/adjustment disorders)*	1,246	69.3 (30.7)
PAS College Students*	1,051	41.3 (28.9)

* Statistically significantly different from current sample ($p < 0.001$)

In addition to comparing mean scores from sample and referent groups, PAS P scores for this study were categorized into one of six groups, corresponding to the relative concern for uncovering emotional and behavioral problems on further assessment. In this study, 97 (64.6%) of participants had PAS P scores that reflected a moderate or greater risk for emotional and/or behavioral problems (Table 7). Comments regarding interpretation of scores are taken directly from the PAS Professional Manual (Morey, 1991, p. 11).

Table 7. Categorization of Sample PAS P Scores by Likelihood of Concerning Findings.

PAS P Score Range	N (%)	Risk for Problems	Interpretation
> 99.81	2 (1.3)	Extreme	Reported potential for emotional and/or behavioral problems is substantially greater than is typical for clinic patients.
75.00 – 99.81	65 (43.3)	Marked	Reported potential for emotional and/or behavioral problems is substantially greater than is typical for community adults.
48.00 – 74.99	30 (20.0)	Moderate	There are suggestions of potential emotional and/or behavioral problems of clinical significance.
30.00 – 47.99	22 (14.7)	Mild	Potential for emotional and/or behavioral problems is greater than is typical for community adults.
15.00 – 29.99	11 (7.3)	Normal	Reported potential for emotional and/or behavioral problems is less than is typical for community adults.
< 15.00	20 (13.3)	Low	Reported potential for emotional and/or behavioral problems is substantially less than is typical for community adults.

Condom Use Self-Efficacy Scale (STD concerns) (CUSES-2). Subscale 2 of the Condom Use Self-Efficacy Scale (Barkley Jr & Burns, 2000) focuses on the concern that advocating condom use calls into question whether a potential sexual partner may have a sexually transmitted disease. Scores range from zero to 12, with higher scores indicating greater self-efficacy navigating this concern. In this sample, the median score was ten, with an IQR of 8-12 (see Table 4).

Condom Use Self-Efficacy Scale (Relationships) (CUSES-3). Subscale 3 of the Condom Use Self-Efficacy Scale (Barkley Jr & Burns, 2000) focuses on the concerns related to how a potential sexual partner may react to discussing condom use. Scores range from zero to 12, with higher scores indicating greater self-efficacy navigating this concern. In this sample, the median score was 9, with an IQR of 8-12 (see Table 4).

Message Style Preference Survey – Health Focus (MSPS-H). The Message Style Preference Survey – Health Focus (MSPS-H) is constructed of six gain-frame and six loss-frame messages about condom use contextualized in terms of personal health concerns that may arise when considering sex with a partner. The sample median score of one and an IQR of 0-3 reflect a very slight preference for gain-framed versus loss-framed health concern-based messages. Additionally, overall scores for health-focused gain-framed messages were preferred to loss-framed messages (Median = 17, IQR 12-18 versus Median = 14, IQR 11-17, see Table 8).

Table 8. MSPS Net Scores and Frame X Context Summary Scores (N=150).

Score	Median	IQR
MSPS Health Focus Net Score	1	0-3
MSPS Relationship Focus Net Score	4	1-7
Health Focus Gain Frame Score	17	12-18
Health Focus Loss Frame Score	14	11-17
Relationship Focus Gain Frame Score	16	12-18
Relationship Focus Loss Frame Score	10	8-13

Message Style Preference Survey – Relationship Focus (MSPS-R). The Message Style Preference Survey – Relationship Focus (MSPS-R) is constructed of six gain-frame and six loss-frame messages about condom use, contextualized in terms of relationship concerns that may arise when discussing condom use with a potential partner. The sample median score of four and an IQR of 1-7 reflect a moderate preference for gain-framed versus loss-framed relationship-based messages. Additionally, overall scores for health-focused gain-framed messages were preferred to loss-framed messages (Median = 16, IQR 12-18 versus Median = 10, IQR 8-13, see Table 8).

Sexual Risks Scale – Intention Subscale (DV) (SRS-I). In this study, safe sex behavioral intention (DV) was measured via the Intention subscale of the Sexual Risks Scale (Dehart & Birkimer, 1997). Higher scores reflect higher levels of intention to use condoms with all sexual encounters. Scores range from zero to 28. In this study, the median score was 25, with an IQR of 11-28. The minimum value was zero, and the maximum was 28.

Summaries of the inter-relationships among the independent variables (variables hypothesized to be associated with safe sex behavioral intention) are summarized in Table 8. Key findings will be presented in terms of 1) associations among psychological measures, 2) associations among measures of message framing, and 3) associations of psychological measures with message framing.

Relationships among psychological characteristics. The strongest associations (accounting for more than 10% shared variance) were between the two components of self-efficacy and those with overall psychological adjustment. Self-efficacy regarding STDs was associated with self-efficacy regarding relationships ($r = -.61, p < 0.001$). Overall psychological adjustment was most strongly associated with higher levels of impulsivity ($r = .50, p < 0.001$), depressive symptoms ($r = .42, p < 0.001$), and lower levels of condom use self-efficacy regarding relationships ($r = -.35, p < 0.001$). (see Table 8). Recall that higher scores on the PAS screening tool reflect a greater likelihood of diagnosable pathology on the parent instrument. This explains what may be construed as otherwise inexplicable findings.

Relationships among MSPS scores. There was a statistically significant correlation between MSPS Health and MSPS Relationship net scores ($r = .29, p < 0.001$). As expected and confirming the validity of the Loss and Gain subscales, there were strong inverse associations between the Loss and Gain scores of the respective Health and Relationship messaging scales (Health: $r = -.76$; Relationship: $r = -.62$; both $p < 0.001$). (see Table 9).

Relationships of psychological characteristics with message framing scores. The strongest associations of psychological characteristics with message framing were found for Condom Use Self-Efficacy regarding Relationships and for Impulsivity. Relationships Self-Efficacy demonstrated an inverse association with the Gain side of Health messaging ($r = -.29, p < 0.001$) and a positive association with the Relationship Messaging Net score ($r = .32, p < 0.001$) with a much stronger inverse association with the Relationship Gain side ($r = -.20, p = 0.015$) than with the loss side ($r = -.07, p = 0.371$). Inverse associations with the Gain side of both Health and Relationship Messaging were found for Impulsivity ($r = -.29, p < 0.001$). The only statistically significant association of PAS scores with messaging was an inverse association with

the Gain side of Relationship Messaging ($r = -.19$, $p = 0.020$). No statistically significant associations of depressive symptoms with messaging were observed ($p > 0.05$) (see Table 9).

Table 9. Independent variable inter-correlation matrix (N= 150), Pearson's *r* and (*p*-values). *Italics* indicate inverted variable.

	Depressive Symptoms (PHQ)	Impulsivity (BIS)	<i>Condom Use Self-efficacy</i> STDs	<i>Condom Use Self-efficacy</i> Relationships	Overall Psychological Adjustment	MSPS Health Net Score	MSPS Relationship Net Score	<i>MSPS Health Gain Score</i>	<i>MSPS Health Loss Score</i>	<i>MSPS Relationship Gain Score</i>
Impulsivity (BIS)	.30** (<0.001)									
<i>Condom Use Self-efficacy</i> STDs	.15 (.060)	.27** (.001)								
<i>Condom Use Self-efficacy</i> Relationships	.09 (.25)	.15 (.066)	.61** (<0.001)							
Overall Psychological Adjustment	.42** (<0.001)	.50** (<0.001)	.26** (.001)	.35** (<0.001)						
MSPS Health Net Score	.11 (.164)	-.08 (.315)	-.06 (.462)	-.18* (.028)	-.12 (.132)					
MSPS Relationship Net Score	-.11 (.189)	-.24** (.003)	-.17* (.041)	-.32** (<0.001)	-.29** (<0.001)	.29** (<0.001)				
<i>MSPS Health Gain Score</i>	.00 (.997)	.29** (<0.001)	.19* (.023)	-.29** (<0.001)	.144 (.079)	-.27** (.001)	.34** (<0.001)			
<i>MSPS Health Loss Score</i>	.06 (.461)	.20* (.015)	.12 (.129)	.13 (.120)	.06 (.487)	.35** (<0.001)	-.15 (.073)	.757** (<0.001)		
<i>MSPS Relationship Gain Score</i>	.07 (.401)	.29** (<0.001)	.04 (.653)	.19** (.015)	.19* (.020)	-.15 (.072)	-.364** (0.001)	.825** (<0.001)	.69** (<0.001)	
<i>MSPS Relationship Loss Score</i>	-.05 (.550)	.03 (.750)	-.06 (.462)	-.07 (.371)	-.06 (.446)	.07 (.430)	.411** (<0.001)	.54** (<0.001)	.62** (<0.001)	.62** (<0.001)

NOTE: * correlation is significant at the .05 level (2-tailed). ** correlation is significant at the .01 level (2-tailed).

Findings related to Aim One

Hypothesis One: Depressive Symptoms and Safe Sex Behavioral Intention.

Hypothesis One: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of depressive symptoms are associated with lower levels of behavioral intention for safe sex.

Both the unadjusted and adjusted associations of the covariates and depressive symptoms with safe sex behavioral intention are shown in Table 10. There were no statistically significant associations observed. The multivariate model accounted for only three percent of the variability in safe sex behavioral intention (Multiple $R = .17$, adjusted $R^2 = < 0.01$, $p = 0.494$), with depressive symptoms accounting for 0.2% of that variance (beta = -0.04, $p = 0.601$).

Table 10. Summaries of unadjusted and adjusted associations of depressive symptoms with Safe-Sex Intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.08	.413
Race	.08	.320		.09	.263
Gender	.08	.360		.10	.247
Years with HIV	-.10	.229		-.06	.582
Depressive Symptoms (PHQ)	-.02	.813		-.04	.601

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .17$, $p = 0.494$; $R^2 = .03$ (Adjusted $R^2 = < 0.01$)

Hypothesis Two: Impulsivity and Safe Sex Behavioral Intention. Hypothesis

Two: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of impulsivity are associated with lower levels of behavioral intention for safe sex.

Both the unadjusted and adjusted associations of the covariates and impulsivity with safe sex behavioral intention are shown in Table 11. The multivariate model accounted for only five percent of the variability in safe sex behavioral intention (Multiple $R = .22$, adjusted $R^2 = .02$, $p = 0.206$). While the simple correlation of impulsivity with safe sex behavioral intention was statistically significant ($r = .18$, $p = 0.028$), after including the covariates in the analysis the relationship was no longer statistically significant with impulsivity accounting for approximately 2% of the variance in safe sex intention (beta = .15, $p = 0.081$, see Table 11).

Table 11. Summaries of unadjusted and adjusted associations of impulsivity with Safe-Sex Intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.06	.570
Race	.08	.320		.05	.537
Gender	.08	.360		.07	.406
Years with HIV	-.10	.229		-.06	.551
Impulsivity (BIS)	.18	.028		.15	.081

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .22$, $p = 0.206$; $R^2 = .05$ (Adjusted $R^2 = .02$)

Hypothesis Three: Overall Psychological Adjustment and Safe Sex

Behavioral Intention. Hypothesis Three: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), overall psychological adjustment is associated with higher levels of behavioral intention for safe sex.

Both the unadjusted and adjusted associations of the covariates and overall psychological adjustment with safe sex behavioral intention are shown in Table 12. The multivariate model accounted for only five percent of the variability in safe sex behavioral intention (Multiple $R = .22$, adjusted $R^2 = .02$, $p = 0.200$). While the simple correlation of overall psychological adjustment with safe sex behavioral intention was statistically significant ($r = .17$, $p = 0.040$), after including the covariates in the analysis the association was no longer statistically significant with overall psychological adjustment accounting for slightly more than two percent of that variance ($\beta = .15$, $p = 0.077$, see Table 12).

Table 12. Summaries of unadjusted and adjusted associations of overall psychological adjustment with Safe-Sex Intention (N=150).

<u>Characteristic</u>	<u><i>r</i></u>	<u><i>p</i>-value</u>		<u><i>beta</i></u>	<u><i>p</i>-value</u>
Age (years)	-.10	.206		-.07	.453
Race	.08	.320		.08	.321
Gender	.08	.360		.07	.448
Years with HIV	-.10	.229		-.05	.621
Overall Psychological Adjustment (PAS)	.17	.040		.15	.077

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .22$ $p = 0.200$; $R^2 = .05$ (Adjusted $R^2 = .02$)

Hypothesis Four: Condom Use Self Efficacy related to STDs and Safe Sex

Hypothesis Four: Condom Use Self Efficacy related to STDs and Safe Sex

Behavioral Intention. Hypothesis Four: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-efficacy regarding STD transmission concerns are associated with higher levels of behavioral intention for safe sex.

Both the unadjusted and adjusted associations of the covariates and condom use self-efficacy related to STD concerns with safe sex behavioral intention are shown in Table 13. The multivariate model accounted for only six percent of the variability in safe sex behavioral intention and was not statistically significant (Multiple $R = .24$, adjusted $R^2 = .03$, $p = 0.117$). The correlation of condom use self-efficacy related to STD concerns with safe sex behavioral intention was statistically significant ($r = .18$, $p = 0.025$) and remained at that approximate strength after the inclusion of the covariates ($\beta = .18$, $p = 0.031$, 3.6% variance explained, see Table 13).

Table 13. Summaries of unadjusted and adjusted associations of condom use self-efficacy related to personal health with Safe-Sex Intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.08	.410
Race	.08	.320		.09	.272
Gender	.08	.360		.07	.423
Years with HIV	-.10	.229		-.05	.582
Condom Self-Efficacy (CUSES-2)	.18	.025		.18	.031

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .24$, $p = 0.117$; $R^2 = .06$ (Adjusted $R^2 = .03$)

Hypothesis Five: Condom Use Self Efficacy related to relationship issues and Safe Sex Behavioral Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-efficacy about relationship concerns are associated with higher levels of behavioral intention for safe sex.

As shown in Table 14, both the unadjusted and adjusted associations condom use self-efficacy related to relationship concerns with safe sex behavioral intention were statistically significant. The multivariate model accounted for eleven percent of the variability in safe sex behavioral intention (Multiple $R = .34$, adjusted $R^2 = .08$, $p = 0.003$). After including the demographic variables, condom use self-efficacy related to relationships accounted for nine percent of that variance (beta = .30, $p < 0.001$).

Table 14. Summaries of unadjusted and adjusted associations of condom use self-efficacy related to relationship concerns with Safe-Sex Intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.12	.224
Race	.08	.320		.10	.233
Gender	.08	.360		.05	.543
Years with HIV	-.10	.229		-.03	.782
Condom Self-Efficacy (CUSES-3)	.29	<.001		.30	<.001

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .34$, $p = 0.003$; $R^2 = .11$ (Adjusted $R^2 = .08$)

Findings related to Aim Two

Gain-framed and Loss-framed Personal Health Safe Sex Messages and Safe Sex Behavioral Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), preference for gain-framed or loss-framed messages (about personal health concerns) with safe sex behavioral intention was explored.

Both the unadjusted and adjusted associations of the covariates and the net Gain/Loss framed message scores related to personal health concerns with safe sex behavioral intention are shown in Table 15. The multivariate model accounted for seven percent of the variability in safe sex behavioral intention (Multiple $R = .26$, adjusted $R^2 = .04$, $p = 0.063$). Findings for the association of the net Gain/Loss Health Messaging values with behavioral intention were statistically significant in both accounting for approximately 4% of that variance in the adjusted model ($beta = -.21$, $p = 0.012$).

Table 15. Summaries of unadjusted and adjusted associations of preferences for gain or loss framed messages related to personal health with Safe-Sex Intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.10	.314
Race	.08	.320		.10	.244
Gender	.08	.360		.13	.120
Years with HIV	-.10	.229		-.07	.501
Gain/Loss Frame Messages Related to Health (MSPS-H): Net Score	-.17	.040		-.21	.012

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .26$, $p = 0.063$; $R^2 = .07$ (Adjusted $R^2 = .04$)

An analysis that included the separate Gain and Loss Health Messaging values was conducted to assess the relative strength of the associations of scores assessing

responses to personal health-based gain-framed and personal-health based loss-framed messages with safe sex behavioral intention. In unadjusted analyses, the correlations between both gain-framed ($r = .52, p < .005$) and loss-framed ($r = .41, p = .014$) health messages and safe sex behavioral intention were statistically significant (Table 16). In the adjusted model however, the association of gain-framed health messages accounted for most of the influence of the net scores on safe sex behavioral intention. The Gain framed messages remained statistically significant ($beta = .55, 30\%$ shared variance, $p < 0.001$) while the Loss framed messages did not ($beta = -.01, < .1\%$ shared variance, $p = 0.966$).

Table 16. Summaries of unadjusted and adjusted associations of gain-framed and loss-framed messages regarding personal health with safe sex intention (N=150).

<u>Characteristic</u>	<u>r</u>	<u>p-value</u>		<u>beta</u>	<u>p-value</u>
Age (years)	-.10	.206		-.07	.448
Race	.08	.320		.01	.900
Gender	.08	.360		.18	.016
Years with HIV	-.10	.229		.01	.850
Gain Frame Health Messages	.52	< 0.001		.55	< 0.001
Loss Frame Health Messages	.41	<0.001		-0.01	.96674

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
 Safe-sex Intention (SRS) was inverted and log-transformed. Gain Frame Relationship Messages and Loss Frame Relationship Message scores were both inverted.

Multiple $R = .55, p < 0.001; R^2 = .30$ (Adjusted $R^2 = .27$)

Gain-framed and Loss-framed Relationship-based Safe Sex Messages and Safe Sex Behavioral Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), preference for gain-framed or loss-framed messages (about relationship concerns) with safe sex behavioral intention was explored.

Summaries of the unadjusted and adjusted associations of the net Gain/Loss framed message scores related to relationships with safe sex behavioral intention are shown in Table 17. Slightly stronger associations were observed for the relationship messaging than those observed for health concerns. The multivariate model accounted for 20 percent of the variability in safe sex behavioral intention (Multiple $R = .44$, adjusted $R^2 = .17$, $p < 0.001$). Again the associations of the net Gain/Loss Health Messaging values with behavioral intention were statistically significant in both analyses accounting for approximately 17% of that variance in the adjusted model ($beta = -.42$, $p < 0.001$).

Table 17. Summaries of unadjusted and adjusted associations of preferences for gain or loss framed messages related to relationship concerns with safe sex intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.04	.629
Race	.08	.320		.09	.232
Gender	.08	.360		.09	.248
Years with HIV	-.10	.229		-.12	.202
Gain/Loss Frame Messages Related to Relationships (MSPS-R): Net Score	-.40	<.001		-.42	<.001

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Multiple $R = .44$, $p = <0.001$; $R^2 = .20$ (Adjusted $R^2 = .17$)

Contrary to the findings from the specific Gain-Framed and Loss-Framed messages related to health concerns, both types of messages regarding relationships

explained a statistically significant portion of the variance in safe sex behavioral intention values. As shown in Table 18, in the adjusted model Gain-Framed message scores were positively associated with safe sex behavioral intention ($beta = .63$, 40% shared variance, $p < 0.001$) and Loss-Framed message scores, while making a much smaller contribution, demonstrated a statistically significant inverse association ($beta = -.20$, 4% shared variance, $p = 0.031$).

Table 18. Summaries of unadjusted and adjusted associations of condom use self-efficacy related to gain-framed and loss-framed Relationship messages (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.06	.454
Race	.08	.320		-.02	.810
Gender	.08	.360		.12	.083
Years with HIV	-.10	.229		-.03	.715
Gain Frame Relationship Messages	.51	< 0.001		.63	< 0.001
Loss Frame Relationship Messages	.20	.014		-.20	.031

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed. Gain Frame Relationship Messages and Loss Frame Relationship Messages were both inverted.

Multiple $R = .55$, $p < 0.001$; $R^2 = .30$ (Adjusted $R^2 = .27$)

Gain-framed and Loss-framed Safe Sex Messages and Safe Sex Behavioral

Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), as well as controlling for depressive symptoms, impulsivity, condom use self-efficacy, and overall psychological adjustment, a preference for association of gain-framed or loss-framed messages (about personal health or relationship concerns) with safe sex behavioral intention was explored.

Results from a hierarchical regression analysis used to explore this question in terms of the net gain/loss message scores are summarized in Table 19. The initial step of

this analysis that included only the demographic variables was not statistically significant (Multiple $R = .17, p = .338$) and accounted for only three percent of the variability in safe sex behavioral intention scores (R^2 change = .03, $p = .388$). The addition of the set of psychological characteristics (depressive symptoms, impulsivity, condom use self-efficacy, overall psychological adjustment) resulted in a statistically significant increase in explanatory information (R^2 change=.11, $p = 0.005$; overall adjusted model $R^2=.08, p = 0.013$). The addition of the two net gain/loss messaging scores resulted in a similar and statistically significant further increase in explanatory value (R^2 change=.11, $p < 0.001$; overall adjusted model $R^2=.18, p < 0.001$). Of the two net gain/loss messages scores, only the influence of the net relationship message scores on safe sex behavioral intention accounted for the statistically significant component of that overall increase in explanatory value ($beta = -.34, p < 0.001$).

Table 19. Summary of results from hierarchical multiple linear regression of net health and relationship messages on safe sex behavioral intention, controlling for demographic and affective characteristics.

Characteristic	Beta	<i>p</i> -value	<i>R</i>	<i>p</i> -value	R ² -change	<i>p</i> -value
<i>Step 1</i>			.17	.388	.03	.388
Age	-.08	.428				
Race	.09	.264				
Gender	.09	.261				
Years with HIV	-.05	.610				
<i>Step 2</i>			.37	.013	.11	.005
Age	-.10	.289				
Race	.06	.467				
Gender	.04	.677				
Years with HIV	-.05	.642				
Depressive Symptoms (PHQ-2)	-.12	.176				
Impulsivity (BIS)	.12	.220				
Overall Psychological Adjustment (PAS)	.05	.630				
Condom Self-efficacy – STD concerns (CUSES-2)	-.02	.842				
Condom Self-efficacy – Relationship concerns (CUSES-3)	.29	.007				
<i>Step 3</i>			.49	<0.001	.11	< 0.001
Age	-.07	.421				
Race	.08	.319				
Gender	.07	.365				
Years with HIV	-.11	.280				
Depressive Symptoms (PHQ-2)	-.11	.183				
Impulsivity (BIS)	.06	.548				
Condom Self-efficacy – STD concerns (CUSES-2)	.02	.812				
Condom Self-efficacy – Relationship concerns (CUSES-3)	.16	.136				
Overall Psychological Adjustment (PAS)	-.002	.986				
Message Style Preference Survey – Health Messages Net Score	-.06	.483				

Message Style Preference Survey – Relationship Messages Net Score	-0.34	<0.001				
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Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
 Safe-sex Intention (SRS) was inverted and log-transformed. Gain Frame Relationship Messages and Loss Frame Relationship Messages were both inverted.

Adjusted R²: Step 1: .001, Step 2: .08, Step 3: .18

To further evaluate the influence of gain/loss messages, a second multiple linear regression was conducted to assess the relative associations of the specific gain and loss-framed personal health-based messages and specific gain and loss framed relationship-based messages with safe sex behavioral intention. As demonstrated previously and repeated in Table 20, each of the unadjusted associations of the four message frames/foci with safe sex behavioral intention were statistically significant. Consistent with the net scores analysis above, only the relationships of the relationship gain messages ($\beta = .39, p = .006$) and loss messages ($\beta = -.22, p = .032$) were uniquely instrumental in explaining variability in safe sex behavioral intention. Neither health-focused gain ($\beta = .25, p = .098$) nor loss ($\beta = .07, p = .556$) messages were statistically significantly associated with safe sex behavioral intention.

Table 20. Summaries of unadjusted and adjusted associations of all study variables including specific gain-frame and loss-frame message scores with safe sex behavioral intention (N=150).

Characteristic	<i>r</i>	<i>p</i> -value		<i>beta</i>	<i>p</i> -value
Age (years)	-.10	.206		-.08	.346
Race	.08	.320		-.001	.993
Gender	.08	.360		.13	.085
Years with HIV	-.10	.229		-.01	.865
PHQ-2 Score (Depressive symptoms)	-.02	.813		-.10	.207
BIS Score (Impulsivity)	.18	.028		-.06	.530
Condom use self-efficacy – STD concerns	.18	.025		.06	.520
Condom use self-efficacy – relationship concerns	.29	<0.001		.07	.480
PAS (Overall Psychological Adjustment)	.17	.040		.04	.639
Message Style Preference Survey – Relationship Gain Messages	.51	<0.001		.39	.006
Message Style Preference Survey – Relationship Loss Messages	.20	.014		-.22	.032
Message Style Preference Survey – Health Gain Messages	.52	<0.001		.25	.098
Message Style Preference Survey – Health Loss Messages	.41	<0.001		.07	.556

Note: For interpretation of gender, 0=Male, 1=Female; Race: 0=Black, 1=White
Safe-sex Intention (SRS) was inverted and log-transformed.

Gain Frame Relationship Messages and Loss Frame Relationship Message scores were both inverted.

Multiple $R = .61$, $p < 0.001$; $R^2 = .37$ (Adjusted $R^2 = .31$)

CHAPTER V

DISCUSSION

The purpose of the study was to investigate psychological adjustment factors related to message framing preferences and their association with intentions to engage in safe sex. Associations between safe sex behavioral intention and depressive symptoms, impulsivity, psychological adjustment, self-efficacy related to STD concerns and relationship issues, and gain-framed and loss-framed safe sex messages related to personal health or relationship issues were assessed using linear regression techniques. In unadjusted models, impulsivity, psychological adjustment, self-efficacy related to both STD concerns and relationship issues, and gain-framed and loss-framed safe sex messages related to personal health or relationship issues were statistically significantly associated with safe sex behavioral intention. In a hierarchical regression model controlling for both demographic and psychological adjustment covariates, only relationship gain and relationship loss messages were associated with safe sex intention. A detailed discussion of each of these findings follows.

Sample Characteristics

The sample obtained for this study was both more Black and more female than the entire clinic population. In comparison to larger populations of people with HIV, the sample used in this study was more Caucasian (Pence et al., 2007). While this study was not focused on condom use, one of the exclusionary criteria for this study was reported refusal to use condoms in any sexual activities. The rationale for this exclusionary criterion was that including responses regarding condom use from individuals who categorically refuse to use condoms would skew the study results, as they had firm

behavioral intention to not ever use condoms. This exclusionary criterion is a distinctive feature of this sample. Finally, it is important to note that in 2014, approximately 86% of the clinic's total population had a suppressed HIV viral load, meaning that they were effectively suppressing their virus and thereby blunting damage to their immune system. In contrast, the CDC reports that, for 2011, only 30% of people living with HIV in the USA had achieved virologic suppression (CDC, 2014). This result may be due to the wide range of resources available to all patients of the study clinic, the unique nature of long-term relationships that patients develop with clinic staff and providers, and the sense of encouragement and empowerment that all clinic employees seek to provide all of their patients. It should be noted that all of these factors may affect external validity and limit the generalizability of this study's findings to other clinics.

In this study, self-reported condom use was designated as "Sometimes" by 27% of the sample, and as "Always" by 73% of the sample. There are no comparative data regarding estimates of consistent condom use for the entire clinic population. However, there are validity concerns about such a large percentage of the sample reporting consistent condom use. For comparison purposes, in a sample of approximately 3500 individuals with HIV, only 24.4% reported that they "always" used condoms (Smith, Herbst, Zhang, & Rose, 2015). Data from another study that included HIV-negative men who have sex with men in five Southern US cities revealed rates of unprotected anal intercourse as high as 57% (Sullivan, Salazar, Buchbinder, & Sanchez, 2009). Data from the CDC regarding all men who have sex with men reflect an increase in at least one instance of unprotected anal intercourse annually from 48% in 2005 to 57% in 2011 (Paz-Bailey et al., 2013). Another study revealed 15% of people stating they "always" used

condoms had a new-incident STD 30 days after a baseline screening and STD treatment (Zenilman et al., 1995). Because 73% of this sample reported they “always” used condoms, it is possible that social desirability responses may have played a role because each provider in the study clinic has maintained their own panel of patients for many years. Therefore, unique bonds may have developed between patient and provider that may have subtly influenced the desire of study participants to respond to survey statements in a manner that would please their provider. Alternatively, this high percentage of consistent condom users might reflect the inclusion of females in the sample versus exclusively MSM samples from other studies. Finally, this result may reflect the actual condom use patterns of clinic patients engaged in care and coming to clinic. There is no way to further explore this possibility, as HIV and STD biomarkers were not collected for this study.

Findings Specific to Study Questions: Aim One

Depressive symptoms and Safe Sex Behavioral Intention. Hypothesis 1: In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of depressive symptoms are associated with lower levels of behavioral intention for safe sex.

The prevalence of depressive symptoms in this sample was aligned with samples from other groups of people living with HIV (Sherr, Clucas, Harding, Sibley, & Catalan, 2011); however, the first aim was not supported by study findings. This finding was in contrast to the findings of other studies supporting links between increased levels of depression and increased unsafe sex (Alvy et al., 2011; Bancroft et al., 2003; Corless et al., 2012b; DiMatteo et al., 2000; Lauriola et al., 2005; Pence et al., 2006). One

explanation for our findings would be the use of different conceptual measurements. This study measured safe-sex behavioral intention rather than actual reports of unsafe sex.

Another possible explanation of findings would be related to instrumentation. In this study, the two-item PHQ-2 was used to assess study participants for depressive symptoms. This decision was based on use of this instrument in other samples of adults living with HIV as well as a desire to minimize participant instrument burden. The PHQ-2 does not delineate severity of depressive symptoms; the instrument only serves to identify the presence of depressive symptoms. It would be reasonable to speculate that there might be correlations between severity of depressive symptoms and intention to practice safe sex. Another explanation for unexpected findings in this study would be that there is no significant association between depressive symptoms and safe-sex intention because many individuals with depressive symptoms still intend to practice safe sex. This supposition, in turn, may be a reflection of the fact that clinic patients have access to a range of physical, mental, and social supports that are not available to HIV-positive people not engaged with a clinic that provides the services available at the Vanderbilt Comprehensive Care Clinic. Yet another explanation may be a social desirability response bias. As previously mentioned, unique relationships with clinic providers may also have influenced responses to study questions. These factors may have subtly influenced some subjects to under-estimate depressive symptoms and over-estimate their safe sex intention (Malat et al., 2006).

Impulsivity and Safe Sex Behavioral Intention. *Hypothesis 2:* In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of impulsivity are associated with lower levels of behavioral intention for safe sex.

While there was a statistically significant association between impulsivity and safe sex intention in the unadjusted model, impulsivity was not associated with safe sex behavioral intention when the demographic covariate influence was removed. In this study, the hypothesis that impulsivity would be associated with risky sex was based partly on the assumption that individuals seeking immediate relief from stress (imposed by self or others) would be less careful with sexual behaviors than those engaging in sex for intimacy reasons (Cooper, Shapiro, & Powers, 1998).

One possible explanation for this finding would be that there is no association between impulsivity and safe sex behavioral intention in people living with HIV/AIDS. There are no published studies to either support or refute this argument. One of the unique factors of this study was the assessment of impulsivity with safe sex behavioral intention. While impulsivity has been associated with risky sex (Alvy et al., 2011; Corless et al., 2012b; DiMatteo et al., 2000; Lauriola et al., 2005; Pence et al., 2006), impulsivity has not been linked to safe sex intention.

Another possibility for these findings would be response bias. As is true with other variables used in this study, there are social costs that patients feel are associated with being totally honest with their providers if they felt they would disappoint their provider or feel ashamed of their disclosure (Malat et al., 2006) Further studies of impulsivity in HIV samples might shed light on this unanswered question.

Overall Psychological Adjustment and Safe Sex Behavioral Intention.

Hypothesis 3. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), overall psychological adjustment is associated with higher levels of behavioral intention for safe sex.

In an adjusted model, no statistically significant associations of overall psychological adjustment with safe sex behavioral intention were observed. The most probable explanation for this finding is the fact that the PAS is a comprehensive screening tool that assesses the likelihood of behavioral problems across ten distinct domains (Negative Affect, Acting Out, Health Problems, Psychotic Features, Social Withdrawal, Hostile Control, Suicidal Thinking, Alienation, Alcohol Problem, Anger Control). Relative to other psychological constructs explored in this study, overall psychological adjustment is a global construct. The rationale for including this measure in this study was that, had associations between overall psychological adjustment and safe sex behavioral intention been established, that finding might have supported including the PAS screening tool in future clinical research studies. It is entirely plausible to suggest that scores on this instrument would not be correlated with safe sex behavioral intention, as not all of the ten domains of the PAS have been associated with risky sexual behavior. The sample size for this study (150) did not allow for exploration of findings at the domain level.

Condom use self-efficacy related to STD concerns and Safe Sex Behavioral

Intention. *Hypothesis 4.* In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-efficacy regarding STD transmission concerns are associated with higher levels of behavioral

intention for safe sex.

The fourth hypothesis in this study focused on condom use self-efficacy related to STD transmission, arguably a personal health concern. This approach was intentionally done in order to better align self-efficacy measurements with the personal health focus of one set of the gain and loss-framed messages in the MSPS. No statistically significant associations were found. While there is evidence from the literature (Albarracin et al., 2001; Pulerwitz et al., 2002; Romero et al., 2011) associating self-efficacy with higher levels of condom usage, there are no published studies assessing the strength and direction of the association between condom use self-efficacy related to STD transmission concerns and safe sex behavioral intention.

One explanation for the unexpected findings in this study would be that significant associations in the literature were between self-efficacy and condom usage rather than safe sex behavioral intention, as these are unique constructs. Another explanation may be that, in this sample, participants already have HIV, arguably the most concerning and life-threatening of the sexually transmitted diseases. This fact may have diluted the utility of the instrument, as the focus of this section of the instrument was on the relationship implications of asking a new partner to use a condom, with the stated concern that doing so would imply that one of the actors in the relationship had an STD. Perhaps a new instrument might be developed in the future to assess relationship risks related to condom use in people with existing sexually-transmitted diseases.

Condom use self-efficacy related to relationship concerns and Safe Sex Behavioral Intention. *Hypothesis 5.* In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), higher levels of self-

efficacy about relationship concerns are associated with higher levels of behavioral intention for safe sex.

The fifth hypothesis in this study focused on condom use self-efficacy as it relates to relationship concerns; i.e., whether an individual might feel that their partner would reject them if they advocated condom use, or be embarrassed if condom use were attempted and was unsuccessful. The association between safe sex behavioral intention and condom use self-efficacy in relationships was significant, a finding aligned with studies (Albarracin et al., 2001; Barkley Jr & Burns, 2000; Widman et al., 2013) that have assessed associations among safe sex self-efficacy and safe sex behaviors, a distinct but possibly related construct from safe sex behavioral intention. As discussed earlier, one unique feature of this study is the focus on safe sex intention versus safe sex behavior, based on theoretical and clinical evidence that measures of intention may be more robust than self-report of past behaviors. There are presently no published studies assessing the strength and direction of an association between condom use self-efficacy related to relational concerns and safe sex behavioral intention.

As has previously been argued, condom use/non-use in people living with HIV has relational implications; i.e., asking a partner to use a condom may imply a lack of trust. These findings suggest that if individuals have confidence in their ability to maintain a relationship with a desirable partner, they are more likely to endorse safe-sex behavioral intention. Theoretically, fear of rejection or unfavorable reactions from a partner are less likely to dissuade individuals with high relational self-efficacy scores from intending to use safe sex practices.

Findings Specific to Study Questions: Aim Two

Safe sex messages focused on personal health and Safe Sex Behavioral

Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), preference for gain-framed or loss-framed messages (about personal health concerns) with safe sex behavioral intention was explored.

Analyses for Aim Two revealed that, that, after controlling for demographic variables, there was an association of preference (expressed as the net score of both gain framed and loss framed message responses) for gain-framed messages about personal health concerns with safe sex behavioral intention. There were three findings presented, and each of these findings was statistically significant. First, in both unadjusted and adjusted models, there was a statistically significant relationship between net scores for health-based messages and safe sex intention. The multivariate model approached statistical significance ($p = 0.063$). These findings, aligned with the theoretical framework for the study, suggest that people with HIV may be influenced by safe sex messages contextualized around personal health. Second, the gain-framed health messages were strongly associated with safe sex intention in both univariate and multivariate models. Finally, the loss-framed health messages failed to achieve statistical significance after the influence of the demographic covariates was removed.

The finding that only gain-framed health messages were statistically significantly associated with safe sex intention in an adjusted model is also aligned with theory which suggests that many people view condom use as a health prevention behavior, in spite of the unique dyadic characteristics of intercourse that have been discussed previously. The findings also suggest that people with HIV may be more open to safe sex messages

delivered in a gain frame versus a loss frame. This is an important finding from this study, as it lends support to the possibility that one way to enhance receptivity to safe sex messaging would be to shift safe sex messages from a loss frame to a gain frame.

Safe sex messages focused on relationship concerns and Safe Sex Behavioral Intention. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), preference for gain-framed or loss-framed messages (about relationship concerns) with safe sex behavioral intention was explored.

Analyses for Aim Two revealed that, after controlling for demographic variables (age, race, gender, years with HIV), there were associations of preference for gain-framed and loss-framed messages about relationship concerns with safe sex behavioral intention. There were three findings presented, and each of those findings was statistically significant. First, in both unadjusted and adjusted models, there was a statistically significant relationship between net scores for relationship-based messages and safe sex intention. The multivariate model was statistically significant ($p < 0.001$). The beta for relationship-focused messages, (-0.42), was double that for the health-focused messages (-0.21). The inverse nature of the association is due to the fact that the dependent variable, safe sex behavioral intention, was inverted in order to meet standards of normalcy for statistical analysis. This finding, aligned with the theoretical framework for the study, suggests that people with HIV may be more receptive to safe sex messages contextualized around relationship risks than around personal health. Second, the gain-framed health messages were strongly associated with safe sex intention in both univariate and multivariate models. Finally, the loss-framed health messages were

strongly associated with safe sex intention in both univariate and multivariate models after the influence of the demographic covariates was removed.

Interestingly, the beta for gain frame relationship messages was 0.63, while the beta for the loss frame relationship messages was -0.20. In this analysis, all of the variables were inverted. While the former association would be anticipated, the latter was unexpected. The most logical interpretation of this finding, given the statistical tools available for these data, would be that people who gave low rankings to the loss-framed relationship messages concurrently affirmed high levels of safe sex intention. Unfortunately, it is not possible with the tools used in this study to determine the nature and direction of the relationship between these variables, only that there is a statistically significant relationship. This finding may also be interpreted as a statistically significant rejection of the loss framed relationship messages. If correct, this would lend more weight to the observation that, in this sample, people preferred gain-framed to loss-framed messages in general.

Hierarchical Regression Model. In people living with HIV/AIDS, after controlling for demographic variables (age, race, gender, years with HIV), as well as controlling for depressive symptoms, impulsivity, condom use self-efficacy, and overall psychological adjustment, a preference for association of gain-framed or loss-framed messages (about personal health or relationship concerns) with safe sex behavioral intention was explored.

Results from the first step of the hierarchical regression revealed no statistically significant associations among demographic variables and safe sex behavioral intention. This finding is consistent with the theoretical framework used for this study. Since age,

race, gender, or the number of years a person has had HIV do not restrict the act of sexual intercourse between adults living with HIV, this would be an expected finding. Had demographic covariates made a statistically significant contribution to the model, future safe sex messaging campaigns could have been tailored to the relevant demographic covariates.

When scores from psychological variables were added to the regression in step two, there was a significant association with safe sex intention. Of all the psychological variables used in the model, only condom use self-efficacy related to relationships was statistically significantly associated with safe sex intention. This is a salient finding, as it suggests that, in adults living with HIV, focusing safe sex messaging around relationships may improve safe sex intention.

In the third and final step of the regression, net scores from health framed and relationship framed safe sex messages were added. The association between relationship-based safe sex messages and safe sex intention (inverted) was robust (beta = $-.34$, $p < 0.001$). This finding is consistent with the theoretical framework for the study, and further supports the suggestion that adults living with HIV may be more responsive to relationship versus health-based safe sex messages.

When summed scores for each type of message were individually entered into a multiple regression model, each of the four message types was statistically significantly associated with safe sex intention in unadjusted models. However, once the covariate influences of demographics and psychological characteristics were removed, only the associations between safe sex intention and relationship gain ($p = .006$) and relationship

loss ($p = .032$) messages were significant. Scores from statements focusing on personal health were not associated with safe sex intention.

One possible explanation for these findings would be that people who already have HIV are less concerned about contracting another STD than pleasing their partners, or avoiding displeasing their partners. Another possibility would be that people with HIV, exposed to years of personal health-focused safe sex messaging are no longer responsive to those messages. One of the unique contributions of this study to our overall knowledge is that, in this sample, participants had a statistically significant preference for relationship-focused versus personal health focused messages. The percentage of that association that may be due to the novelty of the statements remains unknown at present, but might be further elucidated with use of the Message Style Preference Survey in other samples.

The unexpected findings in this study were related to the patterns of preference between types of message frame and safe sex intention. In this sample, there was a statistically significant association between gain framed, relationship based messages and safe sex behavioral intention. There are significant implications to these findings that will be discussed in the sections that follow.

Summary of overall findings

The intent of this study was to examine associations among a variety of psychological adjustment constructs, a matrix of safe sex messages, and safe sex behavioral intention. After controlling for demographic variables, associations between safe sex behavioral intention and depressive symptoms, impulsivity and overall psychological adjustment were not supported. There was some support for hypotheses

exploring associations between condom use self-efficacy and safe sex behavioral intention. This finding is aligned with findings reported by Kiene, et. al. (2005) that higher levels of involvement in condom use discussions were associated with higher levels of responsiveness to gain-framed and loss-framed safe sex messages. Regarding the matrix of gain and loss framed messages used in this study, findings demonstrated a stronger association for relationship versus personal health messages, with a slight preference for relationship gain messages. If further studies corroborate these findings, a shift from loss-framed personal health messages to gain-framed relationship-based messages may be more effective in encouraging safe sex in this population.

In this sample, gain-framed safe-sex messages, whether focused on personal health or relationship concerns, were statistically significantly associated with safe sex behavioral intention. Regarding the loss-framed messages, only those related to relationship concerns were associated with safe sex behavioral intention. These findings are contrary to those from the only other published study of framed messages and condom use in HIV-positive patients. In that longitudinal study (Richardson et al., 2004), only loss-framed safe sex messages were associated with a reduction in self-reported condom use. Explanations for this difference may be attributed to the use of self-report of condom use as a dependent variable in the Richardson study versus the use of safe sex behavioral intention in this study.

Other possible explanations would include the preponderance of males versus females in the Richardson study (85% male versus 61% male in this study). In addition, different measures were used to assess gain and loss-framed messages. Safe sex messages used in the Richardson study were specific to that work, whereas, in this study, a

relatively new instrument (the Message Style Preference Survey) was used to assess relative strength of preference for gain-framed versus loss-framed messages. While yet to be employed in other settings, that instrument has been used in two different studies in the same HIV clinic and the Cronbach's Alpha values were robust in both samples.

Many studies have validated Rothman and Salovey's (1997) interpretation of Prospect Theory for health messaging (O'Keefe & Jensen, 2009). Specifically, gain-framed messages are preferred when approaching health prevention behaviors, such as using sunscreen to avoid skin cancer (Hoffner & Ye, 2009; Thomas et al., 2011). Because safe sex behaviors may be interpreted as prevention behaviors, the preference for gain-framed messages in this study is aligned with this literature. Furthermore, findings from this study are unique in terms of controlling for both demographic and psychological factors. Future studies using a standardized messaging assessment instrument, such as the Message Style Preference Survey, may help to clarify the source of unexpected findings.

The theoretical framework for this study was an integration of Prospect Theory (gain-framed and loss-framed messages) with the Theory of Planned Behavior which affirms the importance of attitudes (behavioral beliefs), subjective norms (normative beliefs), and perceived control (self-efficacy) as antecedents to behavioral intention. Study findings did not support hypothesized associations among depressive symptoms, impulsivity, overall psychological adjustment, and self-efficacy related to STD transmission concerns and safe sex behavioral intention. Findings revealed that message-framing preference was associated with safe sex behavioral intention, and self-efficacy for relationship concerns was also associated with safe sex behavioral intention. Social norm concerns are reflected in relationship-focused messages that were associated with

safe sex behavioral intention.in this study. These findings underscore the importance of relational concerns to safe sex behavioral intention; anxiety related to displeasing a partner can potentially affect intentions for safe sex practices. Message framing, the variable most proximal to safe sex intention, was shown to have the most statistically significant association with safe sex intention when other variables were controlled for. The findings regarding message framing were aligned with the theoretical model underpinning this study, so there was partial support for the model. The model is causal in nature, and subsequent longitudinal studies would be needed to validate its hypothesized direction in this population.

Critique of Study Design and Methods

This study utilized a descriptive, correlational, cross-sectional design, paired with a convenience sample, a method widely used for exploratory studies. Benefits to this design include relative ease of subject recruitment. Participants were approached when reporting to the HIV clinic for ongoing care and asked to complete a short survey that was designed to minimize subject burden. This process also facilitated the efficient collection of data, as all 150 participants were successfully recruited within an eight-week period.

Study Strengths. The novel contribution of this study lies in the unique collection of validated instruments and analysis of associations used to explore the phenomenon of interest. In addition to a matrix of safe sex messages, both demographic and psychological adjustment characteristics known to be associated with risky sexual behavioral intention were controlled. This study also included responses from both men and women. In addition, the percentage of women in this convenience sample was

greater than that of the overall clinic population. Finally, there was a theoretical foundation guiding this study.

Attempts were made to optimize the validity of data capture in this study. For example, procedural attempts to reduce response bias, i.e., using an iPad for data collection, were carefully built into the study plan. Electronic data collection also ensured completeness of participant responses and eliminated concerns about transcription errors encountered when loading answers from paper-based instruments into a data file for analysis and storage. The candidate also hoped that electronic versus human interview based data collection would elicit more truthful answers from participants by giving them privacy and anonymity.

The research content of this study was that, in this sample, there was a stronger association of safe sex behavioral intention with gain-framed, relationship-based messages than with other types and frames assessed, supporting the principal aim of this study. Although there were no other published studies examining the same set of variables, study findings were similar to other study findings with this population linking relational concerns and communication quality with safe sex behavioral intention.

Study Limitations. The central weakness of cross-sectional samples is the inability to assess causation among variables. Findings from cross-sectional studies are limited to correlational assessments. Cross-sectional studies are useful for exploring the association of a set of variables related to a phenomenon of interest, but place limitations on the findings. Because this study was not examining causal influences of behavior change, a cross-sectional design was appropriate.

Another weakness of this study is reliance on participant self-report. This method of data collection is subject to a myriad of inconsistencies in human memory, as well as pressure to conform to community behavioral norms. In addition, there were risks in asking individuals for information about their emotional states, due to the fact that researchers had no easy way to assess the neutrality of a subject's mood prior to asking them to assess their mood.

In this study, data collection via iPad was used to minimize participant interaction with the study Research Assistant, in hopes of maximizing participant privacy and therefore the likelihood of honest and accurate answers to study questions. Other methods used to heighten participant confidentiality included petitioning the Vanderbilt University IRB for a Waiver of Informed Consent and petitioning the Vanderbilt Institute for Clinical Translation Research for a waiver to document Social Security numbers as part of the process of dispensing study gift cards.

In addition, issues of measurement validity must be addressed. There are a multitude of validated instruments available for the assessment of psychological adjustment constructs, and care was taken in this study to select instruments that were both validated and relatively short. The trade-off in using brief measures lies in limitations related to internal reliability. For example, the two-item PHQ-2, while previously used in other HIV-positive samples, is not used as frequently in depression studies as the Center for Epidemiological Studies-Depression (CES-D) instrument (Sherr et al., 2011).

While the candidate did actively seek to replicate results based on use of selected instruments in other samples of people living with HIV, there was no valid, reliable

published message-framing instrument available. This fact necessitated the development of the Message Style Preference Survey (MSPS), which was used for only the second time in this study, although the development sample was HIV patients. While Cronbach's alphas for the MSPS were acceptable, this new instrument has not been validated via use in other research.

Other response bias issues were more specific to this proposal. For example, response bias may have been inadvertently introduced by the facts that the study took place in the candidate's HIV clinic, and many of the candidate's patients might have been asked to participate. The reality of patients presenting themselves as they perceive their providers wish them to be is well-documented and recognized, and an attempt to address this was made via the administration of study instruments in a private setting with a research assistant not otherwise linked to the clinic. In this study, there was no attempt to include an instrument designed to control for social desirability, such as the Marlowe-Crowne Social Desirability Scale (MC-SDS) (Crowne & Marlowe, 1960). Inclusion of such an instrument may have addressed questions regarding the role of social desirability in participants' answers to study questions.

The major question related to external validity was how these findings might apply to other HIV clinics. The clinic setting for this study is in the Southeastern US, a region marked by poverty and high levels of social marginalization for individuals with HIV (Pence et al., 2010). Almost three-quarters of this sample (73%) stated that they used condoms in all sexual encounters, a percentage called into question by data from other sources. The demographic characteristics of this sample may not have been representative of those in other HIV clinics. As has been noted throughout this

dissertation, relatively high levels of HIV virologic control and engagement in ongoing care characterize the clinic population that was sampled for this study. Because providers maintained consistent relationships with their patients, the bond between provider and patient may have affected response bias and receptivity to messaging. Because a convenience sample was used, self-selection bias may also affect the nature of the findings in this study. All of these factors must be recognized as potentially limiting the generalizability of these findings to other settings and populations.

Implications for Nursing and Clinical Practice

There have been approximately 45,000 new HIV infections in the United States every year for the past five years, in spite of the fact that conversations about consistent condom usage are a part of ongoing clinical care for those with HIV. The purpose of this study was to examine a theoretically based set of psychological characteristics and a matrix of safe sex messages to identify possible associations with safe sex behavioral intention. Findings included the observation that, taken individually, with the exception of self-efficacy measures, hypothesized psychological variables were not associated with safe sex behavioral intention. However, there were consistent, statistically significant associations between gain-framed, relationship-based safe sex messages and safe sex behavioral intention, suggesting that this association may deserve further exploration. This finding is clearly aligned with nursing perspectives on patient empowerment (gain-frame) and the holistic nature of human health (relationship concerns). The goal would be to develop new clinical tools to encourage patients toward safer sexual practices. There are several implications for both research and clinical care.

The most significant positive finding from this study was that, across several models, a consistent pattern of stronger associations between relationship focused messages and safe sex behavioral intention was demonstrated relative to gain and loss-framed health risk messages. This observation suggests that there may be an opportunity to improve safe sex behavioral intention in this population via a fundamental shift toward gain-framed, relationship-focused safe sex messages and away from loss-framed, personal health focused messages.

Another significant finding would be the statistically strong association between condom use self-efficacy related to relationship issues and safe sex behavioral intention, as well as the nearly significant relationship between condom use self-efficacy related to STD transmission issues and intention. These findings, aligned with the bulk of self-efficacy and safe sex research, suggest a possible role for interventions based on empowering patients toward higher levels of self-efficacy as a means to improve rates of consistent condom usage in this population.

Both of these findings are consistent with the nursing paradigm for patient care. Focusing on patient health outcomes by encouraging healthy relationships with others and greater self-efficacy are strategies that are well aligned with nursing and might readily be employed in a variety of clinical settings. This recommendation would be, of course, contingent upon validation of this study's findings via confirmatory research with other samples.

Should further studies corroborate the finding that HIV-positive individuals prefer gain-framed safe sex messages to loss-framed messages, that knowledge would have clear ramifications for the design of safe sex message campaigns. The same observation

may be made regarding the preference for relationship versus personal health based messages seen in this study. Overall, it may be possible that the most effective safe sex messages in this population are gain-framed, relationship-focused messages. It is important to point out that, at the present time, healthcare providers create the vast majority of safe sex messages on an ad hoc basis, and these messages tend to focus on the personal health consequences of unsafe sex. This practice may be partially attributed to a disease-focused paradigm in health care and lack of information about the associations of relationship concerns to safe sex behavior in this population.

A 2013 study investigating factors associated with consistent condom use among African American women (N=242) found that, over a six-month period, the only significant variables studied that were associated with consistent condom usage were those related to partner communication (Crosby et al., 2013). Another study (N = 358) examining the power of communications in increasing safe sex behavioral intention found a lower frequency of unprotected sex in participants with higher scores on both condom use intention and safe sex communication scales (Widman et al., 2013). Similarly, a study of condom use intention in a sample of Latino men living in Los Angeles (N = 191) found higher levels of condom use intention in participants that affirmed relatively higher levels of health protective communication in their relationship (Harvey & Henderson, 2006). Finally, a study of heterosexual undergraduate students (N = 259) found that the most salient predictor of consistent condom use was the ability to enact condom negotiation strategies with a partner (French & Holland, 2013), which implies at least a baseline level of relational conversation prior to intercourse. While a preference for relationship-based messages is not completely analogous with

communication skills, it is also not unreasonable to suggest that people are more motivated to communicate when they are focused on maintaining a relationship. These studies indirectly support the findings in this sample regarding the relative preference for relationship versus health framed safe sex messages. Findings from studies linking communication between partners and safe sex intention were similar to the links in this study between relational concerns and safe sex intention.

Recommendations for Future Research

The concept of safe sex behavioral intention has not been thoroughly investigated in the population of people living with HIV/AIDS. To date, the vast majority of studies in this area have utilized safe sex behavior as the dependent variable, rather than safe sex behavioral intention. More research is needed to explore patient-level factors that may influence safe sex behavioral intention. Psychological adjustment factors did not demonstrate significant associations with safe sex behavioral intention in this study. However, psychological adjustment factors with potential associations to SSBI could be explored in other ways. One possible approach would be to examine the relationships between psychological adjustment factors and safe sex behavioral intention using other measures, such as a more lengthy depression measure. Other variables related to psychological adjustment, such as substance abuse or antisocial tendencies, could be explored with respect to safe sex behavioral intention. This knowledge would help to shape future lines of inquiry in this area.

Intentions for safe sex may be affected by many relational factors. For example, gender, social, racial, and socioeconomic differentials among sexual partners may contribute to asymmetrical power between actors (Pulerwitz et al., 2002). This imbalance

of social power may serve to dilute a person's intention for safe sex behaviors in the immediacy of intercourse. Therefore, one possible line of further inquiry would be a qualitative or mixed-methods assessment of people's recollections of specific instances when intentions for safe sex behaviors were altered by relational concerns. Researchers could also explore possible associations between the strength of a person's sexual self-efficacy related to sexual relationship concerns and any association with safe sex intention. Ultimately, should the findings from this study be corroborated, it might be useful to design and test clinical interventions that would explore the extent to which patients living with HIV might be empowered to resist partner pressure and act in the interest of their own sexual health.

Findings from this cross-sectional study are suggestive, but not predictive, of a relationship between gain-framed, relationship-based safe sex messages and higher levels of safe sex behavioral intention. As a first step in further exploration, other researchers might examine whether or not these findings are replicable. To that end, the candidate plans to make the Message Style Preference Survey available at no cost to all interested researchers, via a web site that would also store all of the data from all instances of use of the instrument.

Future research of this phenomenon of interest might also incorporate larger samples, as this might shed further light on findings in this study that approached, but did not achieve, statistical significance. Sampling only men who have sex with men versus men and women who have sex with men may also provide insights that would improve clinical care. Future studies might focus on possible gender differences and the role of gender in responses to safe sex messages.

Should other researchers corroborate these findings, a next step would be to design and deploy a longitudinal interventional study that could shed light on the relative contribution of gain framed, relationship based messages to improving safe sex behavioral intention over time. An experimental design would be needed to examine the effects of tailored message framing on safe sex intention.

Findings from this sample did not validate hypotheses regarding the influence of psychological characteristics on safe sex behavioral intention. Scientists also do not know whether psychological characteristics might play a role in safe sex behavioral intention among HIV-positive individuals who are not in regular clinical care, or in the larger population of men who have sex with men. Further exploration of these questions might also provide clinically relevant knowledge that could facilitate ongoing attempts to enhance safe sex behavioral intention in people living with HIV/AIDS.

Summary

In this study, a cross-sectional, descriptive, correlation sample was used to explore possible associations among demographic variables, psychological adjustment characteristics, gain framed and loss framed safe sex messages about personal health and relationship concerns, and safe sex behavioral intention in people living with HIV. The study was conducted in one of the largest HIV clinics in the US.

Key findings from this study included a lack of association between safe sex intention and depressive symptoms, impulsivity, and overall psychological adjustment. Condom use self-efficacy related to relationship issues was associated with safe sex intention, although self-efficacy related to STD concerns was not associated with safe sex intention. In this sample there was a preference for gain-framed versus loss-framed safe

sex messages focused on either personal health or relationship issues. Finally, in a model controlling for both demographic and psychological adjustment covariates, only relationship gain and relationship loss messages were associated with safe sex intention. The dependent variable in this study, safe sex behavioral intention, may have been affected by response bias. The issue of social desirability response should be addressed in future studies related to message framing and safe sex intention.

Implications for nursing and clinical practice include the importance of continually focusing health care education and delivery on the whole person versus their disease. In this manner, nurses might naturally extend the scope of their influence to address their patients' relationship as well as personal health concerns. If reproduced in other settings, these findings may provide nurses and other healthcare professionals with a novel avenue for tailoring patient education around safe-sex behaviors. Findings in this study also provided reinforcement of the critical role of self-efficacy in human health, an area clearly within the bounds of nursing to address, regardless of a patient's clinical disease.

Many studies have attempted to distill successful methods for communicating the importance of safe sex in populations with or at significant risk for HIV infection. In spite of this ongoing work, new HIV infections continue at the rate of 45,000 per year here in the United States. If further studies demonstrate positive effects of customized message framing on safe sex intention, the strategy of tailoring (relationship versus personal health) and framing (gain versus loss) safe sex messages may provide clinicians with a useful tool in the ongoing fight to mitigate the HIV epidemic.

IV. APPENDICES.

Appendix A. Conceptual Framework.

Figure 1. Conceptual Framework: Theory of Planned Behavior

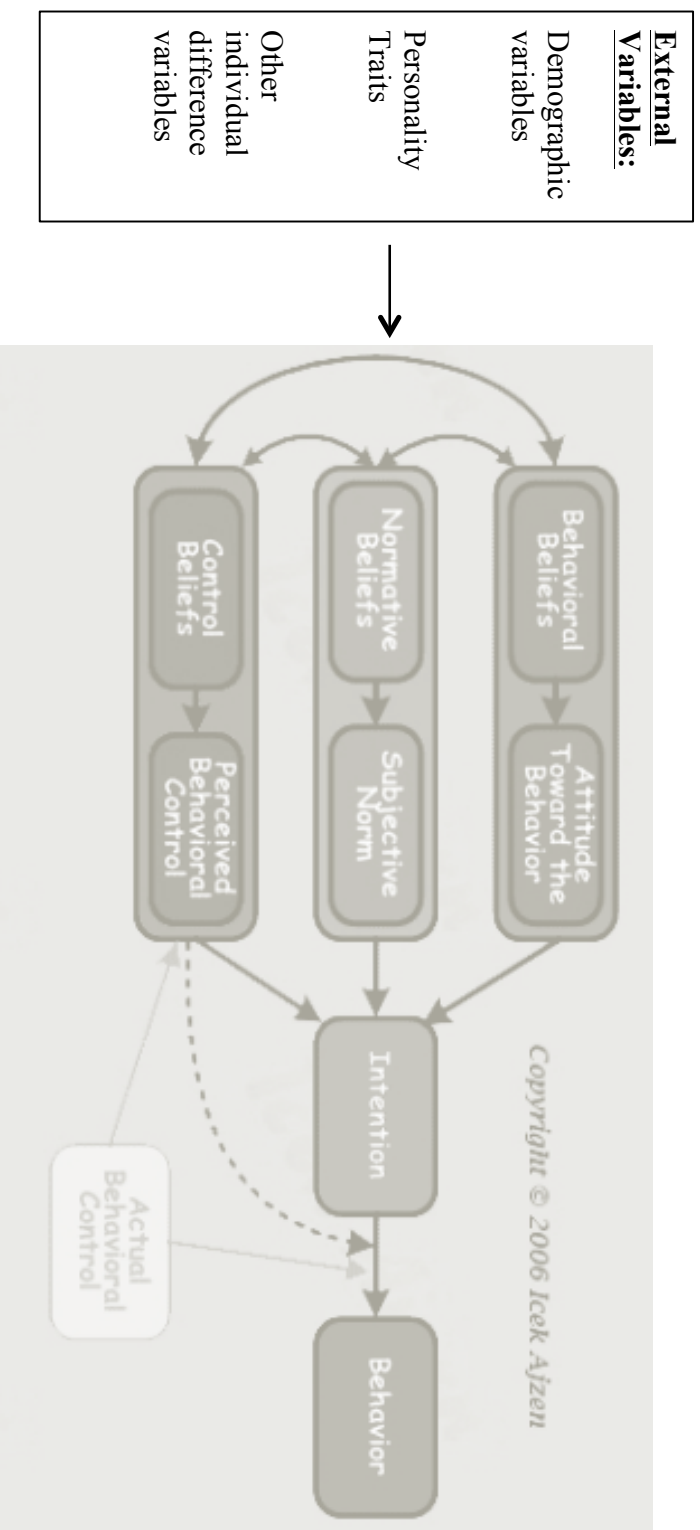
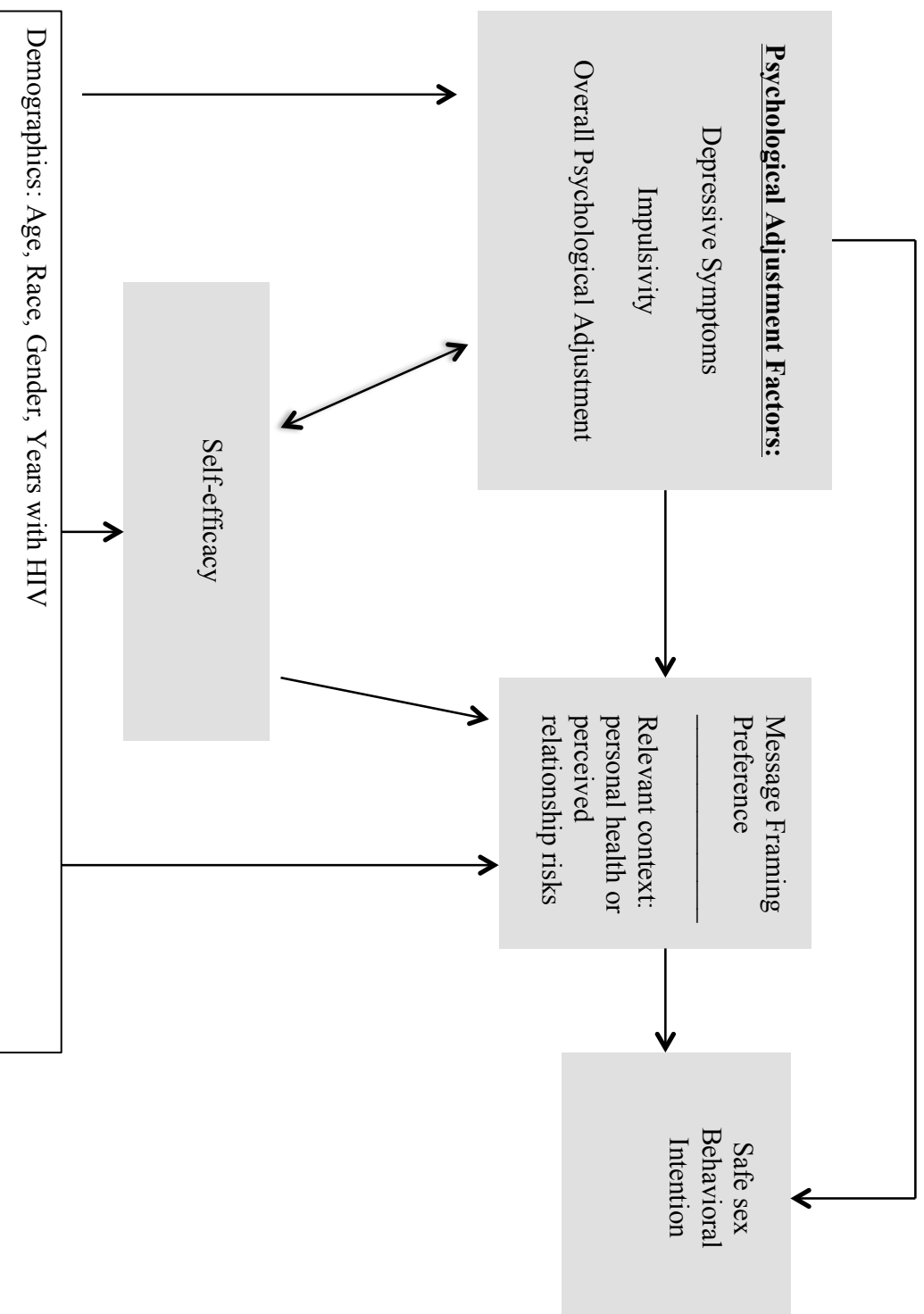


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Figure 2. Conceptual Framework: Association of psychological adjustment factors, self-efficacy, and message framing preference related to health concerns or relationship risks with safe sex behavioral intention.



Appendix B. Instruments.

1. PHQ-2
2. Barratt Impulsiveness Index Brief-8
3. Condom Use Self-Efficacy Scale:
 - b. Relationship risks related to STD exposure subscale
 - c. Partner's reaction to condom use subscale
4. Personality Assessment Screener (PAS)
5. Message Style Preference Survey
6. Sexual Risks Scale:
 - a. safe sex behavioral intention subscale

1. Patient Health Questionnaire-2 (PHQ-2)

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not at All	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things.	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3

2. Barratt Impulsiveness Scale version 11: Brief

	Rarely/Never	Occasionally	Often	Almost always/Always
1. I plan tasks carefully.	1	2	3	4
2. I do things without thinking.	1	2	3	4
3. I don't pay attention.	1	2	3	4
4. I am self-controlled.	1	2	3	4
5. I concentrate easily.	1	2	3	4
6. I am a careful thinker.	1	2	3	4
7. I say things without thinking.	1	2	3	4
8. I act on the spur of the moment.	1	2	3	4

3. Condom Use Self-Efficacy Scale (CUSES)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
<i>Relationship risks related to STD exposure – Subscale 2</i>					
I would not feel confident suggesting condom use with a new partner because I would be afraid he or she would think I've had past homosexual experience.	0	1	2	3	4
I would not feel confident suggesting condom use with a new partner because I would be afraid he or she would think I have a sexually transmitted disease.	0	1	2	3	4
I would not feel confident suggesting condom use with a new partner because I would be afraid he or she would think I thought they had a sexually transmitted disease.	0	1	2	3	4
<i>Partner's reaction to condom use – Subscale 3</i>					
If I were to suggest using a condom to a partner, I would feel afraid he or she would reject me.	0	1	2	3	4
If I were unsure of my partner's feelings about using condoms I would not suggest using one.	0	1	2	3	4
If my partner and I were to try and use a condom and not succeed, I would feel embarrassed to try to use on again.	0	1	2	3	4

4. Personality Assessment Screener Statements

NOTE: Must purchase copyrighted instrument to administer; statements provided here for informational use only.

	False	Slightly True	Mainly True	Very True
1. My friends are available if I need them (reverse scored).				
2. I'm a very sociable person (reverse scored).				
3. I'm a "take charge" type of person.				
4. Sometimes I let things bother me too much.				
5. I've thought about ways to kill myself.				
6. It's often hard for me to enjoy myself because I am worrying about things.				
7. Some people do things to make me look bad.				
8. I've done some things that weren't exactly legal.				
9. It's a struggle for me to get things done with the medical problems I have.				
10. People around me are faithful to me (reverse scored).				
11. I am in good health.				
12. My drinking seems to cause problems in my relationships with others.				
13. I never use illegal drugs (reverse scored).				
14. Some people try to keep me from getting ahead.				
15. I have thought about suicide for a long time.				
16. I have a bad temper				
17. It takes a lot to make me angry (reverse scored).				
18. I spend money too easily.				
19. I make friends easily (reverse scored).				
20. I'm almost always a happy and positive person.				
21. I never drive when I've been drinking (reverse scored).				
22. People think I'm aggressive.				

5. Message Style Preference Survey

Message Style Preference Survey

Instructions: Please read each statement and then circle the number to the right of the statement that indicates how persuasive YOU think the statement is. There are no right or wrong answers.

HOW LIKELY IS EACH OF THESE STATEMENTS TO CONVINCING YOU TO USE A CONDOM

	Not At All	Very Little	Somewhat	To A Great Extent
1. If you plan to use condoms every time you have sex, you will be more likely to protect yourself.	0	1	2	3
2. Your partner may actually respect you more for insisting on using condoms when you have sex.	0	1	2	3
3. Many STDs don't have symptoms, so you can get an STD or HIV from a partner who doesn't know that he is infected if you don't use condoms.	0	1	2	3
4. Condoms may decrease sexual sensations, but you will miss out on longer sex if you don't use them.	0	1	2	3
5. When you get comfortable using condoms correctly and consistently, you will find it a normal part of sex.	0	1	2	3
6. Your partner may respect you less if you don't insist on using condoms when you have sex.	0	1	2	3
7. If you don't practice putting on a condom before you have sex, it will be more difficult to use a condom correctly when you do have sex.	0	1	2	3
8. Not asking your partner to use a condom every time you have sex shows a lack of self-worth.	0	1	2	3
9. Because sexual partners aren't always honest about their sexual history, using condoms will protect you from STDs and HIV.	0	1	2	3
10. If you tend to communicate with your partner openly and honestly, it's easier to ask him to use a condom when you have sex.	0	1	2	3
11. If you don't plan to use condoms every time you have sex, you will be less likely to protect yourself.	0	1	2	3
12. If you don't tend to communicate with your partner openly and honestly, you will be less likely to ask him to use a condom when you have sex.	0	1	2	3

Message Style Preference Survey

Instructions: Please read each statement and then circle the number to the right of the statement that indicates how persuasive YOU think the statement is. There are no right or wrong answers.

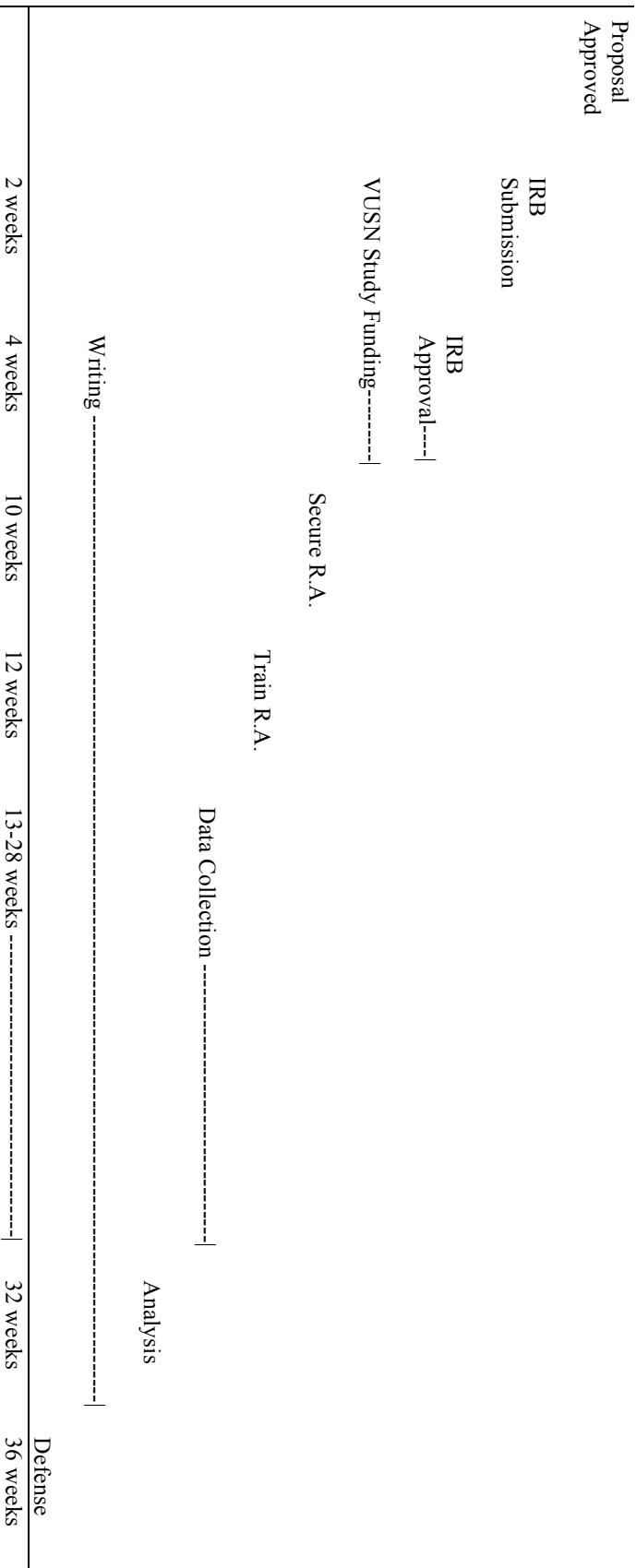
HOW LIKELY IS EACH OF THESE STATEMENTS TO CONVINCe YOU TO USE A CONDOM?

	Not At All	Very Little	Somewhat	To A Great Extent
13. If you don't get comfortable using condoms correctly and consistently, you won't find it a normal part of sex.	0	1	2	3
14. Even though you may think that condoms lessen sexual sensations, you can actually make sex last longer using condoms.	0	1	2	3
15. Many STDs don't have symptoms, so using condoms is the best way to reduce the chance of getting an STD or HIV from a partner who doesn't know he is infected.	0	1	2	3
16. You may damage or harm your relationship if you focus too much on talking about condoms.	0	1	2	3
17. If you practice putting on a condom before you have sex, it will be easier for you to use a condom correctly when you do have sex.	0	1	2	3
18. The best way to protect your relationship is to openly talk about condoms.	0	1	2	3
19. If you don't carry condoms with you, then you might not have one when you need it.	0	1	2	3
20. If you don't use condoms with your partner, you are showing him that you don't care about his health.	0	1	2	3
21. Because sexual partners aren't always honest about their sexual history, failing to use condoms will put you at risk for STDs and HIV.	0	1	2	3
22. If you use condoms with your partner, you are showing him that you care about his health.	0	1	2	3
23. If you always carry condoms with you, then it is easier to make sure that you have one when you need it.	0	1	2	3
24. Asking your partner to use condoms every time you have sex shows self-respect.	0	1	2	3

6. Sexual Risks Scale: Behavioral Intention subscale

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
If I were going to have sex, I would take precautions to reduce my risk of HIV/AIDS.	0	1	2	3	4
“Safer” sex is a habit for me.	0	1	2	3	4
I intend to follow ”safer sex” guidelines within the next year.	0	1	2	3	4
If I were going to have sex in the next year, I would use condoms.	0	1	2	3	4
I would avoid using condoms if at all possible (reverse scored).	0	1	2	3	4
I am determined to practice “safer” sex.	0	1	2	3	4
I would try to use a condom when I had sex.	0	1	2	3	4

Appendix C. Timeline for Dissertation Completion.



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