

2013-01-01

Determinants Of Condom Use And Hiv Prevention Among East-African Immigrants In Minnesota

Mahamud Ahmed

University of Texas at El Paso, mmahmed@miners.utep.edu

Follow this and additional works at: https://digitalcommons.utep.edu/open_etd



Part of the [Public Health Education and Promotion Commons](#)

Recommended Citation

Ahmed, Mahamud, "Determinants Of Condom Use And Hiv Prevention Among East-African Immigrants In Minnesota" (2013).
Open Access Theses & Dissertations. 1774.
https://digitalcommons.utep.edu/open_etd/1774

This is brought to you for free and open access by DigitalCommons@UTEP. It has been accepted for inclusion in Open Access Theses & Dissertations by an authorized administrator of DigitalCommons@UTEP. For more information, please contact lweber@utep.edu.

DETERMINANTS OF CONDOM USE AND HIV PREVENTION AMONG EAST AFRICAN
IMMIGRANTS IN MINNESOTA

MAHAMUD AHMED

Interdisciplinary Health Sciences Doctoral Program

Approved:

Sharon Davis, Ph.D., Chair

Joseph Tomaka, Ph.D.

Oralia Loza, Ph.D.

Richard Posthuma, Ph.D.

Benjamin, C. Flores, PhD
Dean of the Graduate School

Copyright ©

By

Mahamud Ahmed

May 2013

DETERMINANTS OF CONDOM USE AND HIV PREVENTION AMONG EAST AFRICAN
IMMIGRANTS IN MINNESOTA

By

MAHAMUD AHMED, M.S.

DISSERTATION

Presented to the Faculty of the Graduate School of
The University of Texas at El Paso
in Partial Fulfillments
for the Degree of

DOCTOR OF PHILOSOPHY

Interdisciplinary Health Sciences Doctoral Program

THE UNIVERSITY OF TEXAS AT EL PASO

May 2013

ACKNOWLEDGEMENTS

I would like to express my special gratitude to my dissertation chair and advisor, Dr. Sharon Davis for her persistent support, encouragement, and motivation. Dr. Davis provided valuable comments and suggestions that enriched my work. Thank you for giving me the opportunity to work with you. I feel truly indebted to Dr. Joe Tomaka, whose advice, guidance, and suggestions substantially contributed to the quality of this work. Dr. Tomaka was always available to provide assistance when I needed. Moreover, I greatly benefited from his courses on Advanced Research Methods and Multivariate Statistics. Dr. Oralia Loza and Dr. Posthuma, my committee members, also contributed enormously to my work. Their suggestions and comments from the very beginning greatly improved this work. Many thanks go to Dr. E. Lee Rosenthal, my former advisor, who substantially contributed to my training and professional development. Special thank you is due to Dr. Holly Mata, a colleague and a mentor, who introduced me to the Interdisciplinary Health Sciences PhD Program and provided assistance when I needed. Her comments and edits were greatly helpful.

I would also like to express my special thanks and gratitude to the participants of this study who willingly participated and shared their precious time. Without their participation this dissertation would not have been possible. I'm also thankful to the Interdisciplinary Health Sciences PhD program for the financial support and the College of Health Sciences for funding this study. Furthermore, I would also like to thank colleagues and friends at Interdisciplinary PhD Program. Last, but not least, I would like to thank my loved ones, who have supported me throughout the entire study period. I'm particularly grateful to my wife and children who sacrificed so much during my absence. My mother, brothers, and sisters always applauded and supported me, for which, I'm truly grateful.

ABSTRACT

African-born immigrants are at increased risk of HIV infection in the U.S. (Minnesota Department of Health, n. d.; Washington State Department of Health, 2010). In Minnesota, from 2006-2010, the number of new HIV cases per 100,000 persons were the highest among the African-born black population, accounting for 10-15% of all HIV infections in the state while representing only 1.5% of the state's population (Migration Policy Institute, n. d; Minnesota Department of Health, n. d.). The main transmission route for HIV among immigrant population is unprotected heterosexual contact (Beckwith et al., 2009; Johnson, Hu, & Dean, 2010; Washington State Department of Health, 2010). With 80% of new HIV infections transmitted sexually worldwide, correct and consistent condom use is critical element in preventing HIV infections (UNAIDS, 2009). A thorough review of the literature indicates a lack of research that specifically examines psychosocial determinants affecting the use of condoms under the framework of behavioral models in East-African population in the U.S.

This study examined potential correlates of consistent condom use in steady heterosexual relationships among East-African immigrants in Minnesota in two sequential phases: the elicitation (Phase I) and the cross-sectional quantitative survey (Phase II). Information from Phase I conducted (April-May, 2012) was used to develop the survey instrument for Phase II conducted (August-October, 2012). In Phase II, East-African immigrants in Minnesota (n=205) responded to questions on demographic characteristics, attitudes, norms, perceived behavioral control, self-efficacy, intention, acculturation, habit, and social desirable responding based on the Balanced Inventory of Desirable Responding (BIDR). Hierarchical regression models were used to assess the relationship between the main independent variables (attitude, norms, perceived behavioral control, self-efficacy, acculturation, and habit) and the dependent variables

(behavioral intention and self-reported condom use). Mediation analyses were conducted to examine the mediating roles of self-efficacy and attitude in acculturation-intention relationship. Finally, structural equation modeling was used to test the hypothesized model. Self-efficacy emerged as the factor with the strongest and direct influence on intention to use condoms ($\beta=.68$, $p < .001$). In turn, intention was a significant predictor of self-reported condom use ($\beta=.62$, $p < .001$). Behavioral intention accounted for 38% of variance in self-reported condom use ($R^2=.38$, $p < .001$). Together, attitude, norms, perceived behavioral control, and self-efficacy explained 54% of the variation in behavioral intention ($R^2=.54$, $p < .001$). Attitude and self-efficacy did not mediate the association between acculturation and behavioral intention. However, acculturation directly and significantly ($\beta=.16$, $p < .05$) influenced condom use. Thus, interventions to increase condom use among immigrants should not ignore the role of acculturation. Measures to enhance integration through expanded English language training and sexual health education for adults should be tailored to the unique cultural and religious values of the immigrants. Furthermore, strengthening condom use self-efficacy among East-African immigrants is suggested as a main component of public health intervention seeking to curb the spread of HIV and other STIs in Minnesota.

TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	i
ABSTRACT.....	ii
TABLE OF CONTENTS.....	iv
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: LITERATURE REVIEW	17
CHAPTER 3: METHODS.....	34
CHAPTER 4: RESULTS.....	60
CHAPTER 5: DISCUSSION.....	80
REFERENCES.....	90
APPENDIX A.....	109
APPENDIX B.....	111
IRB EXEMPTION	127
CURRICULUM VITAE.....	128

LIST OF TABLES

Table 1: U.S. foreign-born population size by year.....	1
Table 2: Participants' responses: affective attitude.....	39
Table 3: Summary of the themes: affective attitude.....	40
Table 4: Self-reported demographic characteristics of study participants	61
Table 5: Pooled descriptive statistics	62
Table 6: Pooled intercorrelations between main variables in the study	64
Table 7: Pooled hierarchical regression coefficients for intention to use condoms.....	66
Table 8: Pooled hierarchical regression coefficients for self-reported condom use.....	68
Table 9: Goodness-of-fit indicators for model 1 and 2: confirmatory factor analyses.....	72
Table 10: Construct validity and reliability: model 2.....	73
Table 11: Goodness-of-fit indicators for model 1 and 2: full structure	75
Table 12: Measured variables: correlations, means, and standard deviations.....	78

LIST OF FIGURES

Figure 1: Map of Somalia.....	3
Figure 2: Map of Ethiopia.....	5
Figure 3: Integrated Behavioral Model (IBM).....	27
Figure 4: Simple mediational model	53
Figure 5: Hypothesized model (Model 1).....	57
Figure 6: Re-specified model (Model 2).....	59
Figure 7: Mediational analysis: attitude as a mediator of the association between acculturation and intention to use condoms.....	70
Figure 8: Mediational analysis: self-efficacy as a mediator of the association between acculturation and intention to use condoms.....	71
Figure 9: Confirmatory factor analysis: re-specified (Model 2).....	74
Figure 10: Structural model: re-specified (Model 2).....	76

CHAPTER 1: INTRODUCTION

Introduction and Background

The foreign-born population in the U.S. has continued to increase in the last four decades from 9.6 million (4.7%) in 1970 to 38.5 million (12.5%) in 2009 representing one in eight residents in the U.S. (U.S Census Bureau, 2010). See Table 1. A foreign-born person refers to any person who is a naturalized citizen, legal resident, refugee, asylee, student, or undocumented immigrant (The Advocates of Human Rights, 2006).

Table 1

U.S. foreign-born population size by year

Year	Number, million	%
1970	9.6	4.7
1980	14.1	6.2
1990	19.8	7.9
2000	31.1	11.1
2009	38.5	12.5

Source: U.S. Census Bureau (2010)

In 2009, of all foreign-born persons in the U.S., 53% were from Latin American countries while 28% were from Asia. People from Europe comprised 13% of the foreign-born residing in the U.S., and the African-born population represented 4%, followed by 3% from regions such as Oceania and Northern America (U.S. Census Bureau, 2010). The demographic pattern of the U.S. population is thus changing due to the rapid growth of foreign-born populations. For instance, in the state of Minnesota, from 1990 to 2008, immigrant populations grew by 236%, ten times faster than the growth rate (23%) of the native-born population during the same period

(Amherst Wilder Foundation, n. d.). Refugees account for 25-50% of all immigrants per year in Minnesota, much greater than the 8% that refugees account for nationally (Davies, 2004). The changing demographic in the U. S. poses new challenges, specifically in terms of providing health care, disease prevention, and health education services to diverse populations (Beyene, 2004). In the host countries, immigrant and refugee populations are particularly vulnerable to HIV infections due to a constellation of factors including language barriers, cultural practices, and lack of access to health care services (Beyene, 2004; Burns, Imrie, Nazroo, Johnson, & Fenton, 2007; Pavlish, Noor, & Brandt, 2010).

East African Immigrants

Somali Immigrants: The nation of Somalia was founded in July 1960 when the British Somaliland joined the Italian Somaliland (CIA Fact Book, 2011). Somalia is located in the eastern part of Africa (see Figure 1). The country was governed by a democratically elected government until 1969 when a military junta headed by Siad Barre staged a *coup d'état* and overthrew the nascent democracy. The imposed military rule set the stage for the beginning of authoritarian government, characterized by persecution, imprisonment, and political repression. The repressive regime alienated many Somalis who eventually took arms against the government in the late 1980s, culminating in the overthrow of the dictator in 1991 (PBS News Hour, 2008). The created power vacuum coupled with the existing bitter rivalry between different Somali clans triggered full scale clan warfare. The resultant civil strife resulted in enormous humanitarian crises including a huge refugee influx into the neighboring countries and beyond (Foreign & Commonwealth Office, 2011).



Figure 1. Map of Somalia (CIA Fact Book, 2011)

Currently, Somalia has no functioning permanent national government (CIA Fact Book, 2011). It has a population of 8.7 million and land area of 246,199 square miles, approximately equivalent to the state of Texas. Forty-seven percent of its population is between 15-49 years of age. The annual population growth rate is 3.1%. The fertility per woman is 6.2 children and the infant mortality rate is 90 per 1000 live births. Mortality rate for children under five years is even higher at 145 per 1000 live births. The maternal mortality rate is very high at 1400 per 100,000 live births. Life expectancy at birth is 55 years. Somalia is a poor country with gross domestic product per capita of US \$ 298 (UNAIDS, WHO, & UNICEF, 2008; UN data, 2011).

Fleeing from conflicts in their homeland, many Somalis sought refuge in neighboring countries of Kenya and Ethiopia, often in large refugee camps. Countries in Western Europe and the U.S. sponsored refugee families to relocate them (Pavlish, Noor, & Brandt, 2010). Somali refugees began arriving in the U.S. in the 1990s (Ronningen, 2000), and there are an estimated 32,000 Somali refugees living in Minnesota (Williams, 2011) which represents the largest

Somali immigrant community in the U.S. (Ronningen, 2006). About one-third of Somali refugees came to Minnesota directly from refugee camps; the rest were relocated to the state from other states primarily because of the existence of an established Somali community and the availability of unskilled jobs (The Minneapolis Foundation, 2004). There are 70, 000-80,000 foreign-born African immigrants living in Minnesota (Remington, 2008).

Ethiopian Immigrants: Ethiopia is also located in the eastern part of Africa, with a total area of 1.1 million square kilometers (472,000 square miles) which is about the size of Texas, Oklahoma, and New Mexico combined (U.S. State Department, 2011). It borders Eritrea and Djibouti to the northeast, Sudan to the west, Kenya to the south, and Somalia to the east (Encyclopedia of the Nations, 2010) (see Figure 2). In 2008, the United Nations estimated the population of Ethiopia at more than 84 million people (UN, 2008), growing at an annual rate of 2.6 %. The average population density is about 77 people per square kilometer (UN, 2008). However, there are regional variations with the vast majority of the population concentrated in the northern and southern highlands while the lowlands in the southeast, south, and west are sparsely populated (Library of Congress, 2005). The population of Ethiopia is young, which is typical for a society with large number of youth populations. Children under 15 years of age account for 48% of the population, while 49% of the population is in the age range of 15-64 years. About 4% are over age 65. The fertility rate is 5.4 children per woman (Central Statistical Agency & ORC Marco, 2006). Infant mortality rate is high at 79 per 1000 births; mortality for children less than 5 years old is much higher at 131 per 1000 births. Life expectancy for both sexes combined is 55 years and the maternal mortality ratio of 100,000 live births is 720 (UN, 2008). Ethiopia is one of the least urbanized countries in the world with 15% of its population living in urban areas; the rest live in rural settings (Library of Congress, 2005). It is also a

resource-poor country with a human development index of 0.33, giving the country a rank of 157 out of 169 countries (United Nations Development Program [UNDP], 2010).



Figure 2. Map of Ethiopia (CIA Fact Book, 2011)

The exact number of immigrants in the U.S. is difficult to determine because the census data do not provide separate immigrant categories (Beyene, 2004). However, in the year 2000, an estimated 69, 530 Ethiopians were living in the U.S. (Dixon, 2006). The state of Minnesota alone is home for 7,500 Ethiopians, mostly refugees fleeing from persecution in their country (Ronningen, 2004).

Global & sub-Saharan Africa: The Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) have caused tremendous loss of lives around the world in the last three decades. Globally, in 2009 there were 33.4 million people infected with HIV. More than two-thirds (22.5 million) live in sub-Saharan Africa (UNAIDS, 2010). Although new infections of HIV decreased in 2009, 2.6 million people were newly infected. Infections among children through mother-to-child transmission have also declined; however, in 2009, 370,000 children were newly infected (UNAIDS, 2010). Similarly, overall AIDS-related deaths declined by 19% in 2009 as compared to mortalities in 2004. Nonetheless, 1.8 million people died in 2009, of which 72% were Africans (UNAIDS, 2010).

Sub-Saharan Africa bears the brunt of the HIV epidemic especially southern African countries. According to UNAIDS (2010), 34% of all people infected globally live in ten southern African nations, and 31% of all new infections occurred in this region. More than one-third of all AIDS-related deaths and 40% of all adult women infected globally live in southern Africa. Specifically, South Africa has become the epicenter of the HIV epidemic and still remains the most severely affected country in the world with 5.6 million of its people infected; nearly one in four South Africans carry the virus (UNAIDS, 2010). The epidemic in East Africa has declined since 2000 and appears to be stabilizing (UNAIDS, 2010). For example, in Uganda (UNAIDS, 2008; UNAIDS, 2010), the HIV prevalence has been 6.5 -7% since 2000. Likewise, in Ethiopia, adult HIV seroprevalence has stabilized at 2.1% (UNAIDS, 2008). The prevalence in Central and West Africa is relatively low with 12 countries (Benin, Burkina Faso, Democratic Republic of

Congo, Gambia, Ghana, Guinea, Liberia, Mali, Mauritania, Niger, Senegal, and Sierra Leone) reporting prevalence of under 2% (UNAIDS, 2008; UNAIDS, 2010).

Somalia: Even though it is nearly 20 years since the first case of AIDS was diagnosed in the northern port city of Berbera (Somalia) in 1992 (UNGASS, 2010), there is a dearth of literature on the epidemiology of HIV in Somalia. An early survey of seroprevalence of sexually transmitted diseases of 471 residents and female sex workers in the Somali capital, Mogadishu, in 1985 and 1986, revealed a high prevalence of hepatitis B virus (HBV): 37% among pregnant women, 22% among educated women, and 4% among neonates. The prevalence of antibodies for the herpes simplex virus (HSV-1) and cytomegalovirus were 100% and 90%, respectively, but no HIV antibodies were detected in this sample (Jama et al., 1987). Similarly, Nur, Groen, Elmi, Ott, and Osterhaus (2000) analyzed 256 serum samples from blood donors, hospitalized children, and adults in the capital Mogadishu in 1995 and reported 19.1%, 5.6% , and 21.3% seroprevalence of HBV among blood donors, hospitalized children, and adults, respectively. However, none of the samples tested positive for HIV antibodies.

Somalia is one of the sub-Saharan African countries with the lowest HIV prevalence (0.3-1%) (UNAIDS, 2008; UNGASS, 2010). Approximately 43,000 persons in Somalia are living with HIV (UNGASS, 2008); however, there is a regional variation, with the highest number of HIV cases reported from Somaliland (UNGASS, 2008; UNGASS, 2010). The existing relative peace and stability in the Somaliland might have accelerated the HIV epidemic in the region due mainly to the increased mobility and interactions with neighboring countries where the generalized HIV epidemic was already underway (UNGASS, 2010). The lack of awareness and the prevalence of risky sexual behaviors can increase the likelihood of HIV infection in this population (UNGASS, 2010). For example, a survey among 1,018 internally displaced people in

eastern Somalia revealed that 82% did not think they were at risk of contracting HIV, while only 12% had ever used condoms. Forty-eight percent had never heard of condoms, and only 29% had ever seen condoms. The survey indicated that there is still a growing misconception about HIV. Five percent believed that HIV is non-existent. It is not uncommon to find people who think that camel milk and local herbs can cure HIV. These perceptions can undermine health behavior changes and HIV prevention efforts (UNGASS, 2010).

Ethiopia: AIDS was first diagnosed in Ethiopia in 1984, a few years after other African countries (Kloos & Mariam, 2000). The main transmission route of HIV is through heterosexual contacts although other transmission routes such as mother-to-child and contact with infected blood still exist (Kloos & Mariam, 2000). UNAIDS estimates that between 980,000 and 1.1 million Ethiopian adults and children are infected with HIV with an overall adult prevalence of 2.1% (UNAIDS, 2008). However, HIV seroprevalence shows a spatial variation. Urban areas have a significantly higher adult prevalence (7.7%) than the rural areas (0.9%) (Ministry of Health, 2007). The prevalence of HIV also varies between women and men. Women aged 15-24 years have higher HIV seroprevalence, 1.5% versus 0.5% for men in the same age group. (Central Statistical Agency & ORC Macro, 2006; UNAIDS, 2008).

African Immigrants & HIV in the U.S.: In the U.S., at the end of 2008, there were an estimated 1.2 million adults and adolescents living with HIV (CDC, 2011). Although the rate of HIV diagnosis remained stable in the U.S., in 2009, 42,011 people were newly diagnosed with the HIV (CDC, 2011). However, HIV disproportionately affects certain populations in the U.S. In 2009, men who have sex with men (MSM) accounted for 50% of all new infections in the U.S. (CDC, 2011). Black and African-American persons account for 44% of all new infections,

but only represent 14% of the U.S. population. Furthermore, black men are six times more likely to be infected with HIV as compared to non-Hispanic white men (Prejean et al., 2011).

Even though a large proportion of HIV diagnoses occur in African-born persons in Europe and the U.S., surveillance data do not report the proportion of HIV diagnoses among foreign-born Africans in the U.S. (Kerani, et al., 2008). Thus, information on HIV among immigrant communities is sparse. However, some state health agencies now report the incidence of HIV or AIDS in their immigrant communities (Minnesota Department of Health, n. d; Washington State Department of Health, 2010). For example, from 2006-2010 in Minnesota, the number of new cases and rates per 100,000 persons were highest among the African-born black population, accounting for 10-15% of all infections (Minnesota Department of Health, n. d.). In 2007, the rate of HIV infection among African-born blacks was between 96-136 persons per 100,000, three times greater than the rate for African-American persons (Minnesota Department of Health, n. d.). Similarly, in Washington State, the HIV incidence rate among foreign-born Black persons was higher than the rate for African-Americans. Forty-seven percent of new infections among Black persons living in the State of Washington were attributed to Africans born outside the U.S. (Washington State Department of Health, 2010). Although it is not easy to determine where these infections have occurred, many cases of HIV infections among foreign-born Africans are thought to have been in their native countries (Washington State Department of Health, 2010). But many immigrants are also infected in the U.S. (Cartwright, 2006). Among African-born persons newly diagnosed with HIV at Hennepin County Medical Center (Minneapolis), it is estimated that 70% acquired the virus in the U.S. (Cartwright, 2006). Transmissions of HIV among foreign-born Black persons are mainly due to unprotected sex with

a heterosexual partner who is not considered a high-risk population in the U.S. (Beckwith et al., 2009; Johnson, Hu, & Dean, 2010; Washington State Department of Health, 2010).

The number of foreign-born persons living with HIV or AIDS in Minnesota between 1990 and 2010 has increased substantially (Minnesota Department of Health, 2010). In Minnesota, in 1990, there were only 50 foreign-born persons reported to be living with HIV (Minnesota Department of Health, 2010). By 2003, it had increased twelve-folds to 692 persons. The total number of foreign-born persons living with HIV in Minnesota in 2010, was 1,333— a 4% increase from 2009 (Minnesota Department of Health, 2010).

Worldwide, immigrants are at a greater risk for HIV infection than non-immigrants (Decosas, Kane, Anarfi, Sodji, & Wagner, 1995; Lagarde et al., 2003). Harawa, Bingham, Cochran, Greenland, and Cunningham (2002) examined HIV prevalence in blood samples of 61,120 foreign-born and U.S. born patients in California. African-born females had the highest HIV prevalence at 5.7%, followed by men from North Africa/Middle East (4.1%). Men from Caribbean/West Indies had 3.7% HIV prevalence. Individuals from Mexico/Central America had an HIV prevalence of 0.4% for females and 2.5% for males, respectively. In general, the prevalence of HIV among Mexicans/Central American clients was comparable to U.S. born individuals at 0.4 %vs. .6% for females and 2.5 %vs. 2.6 % for males. However, in 2004, the rate of HIV diagnosis per100, 000 among Hispanic men who have sex with men (MSM) was 39, three times higher than the rate for non-Hispanic white MSM (14.6) in the U.S. (Hall, Byers, Ling, & Espinoza, 2007). Women of Asian/Pacific Islander origin and North Africa/Middle East had the lowest HIV prevalence.

Among 222 women of Central American descent living in Los Angeles, only 8.6% reported to have used condoms consistently (Salabaaria-Pena, Lee, Montgemorey, Hopp, & Murales, 2003). Likewise, Haitians living in Quebec (Canada) were disproportionately affected by HIV and AIDS. For example, among Haitian men who did not use condom with their regular partners, 27% did not use condom with their casual partners (Adrien, Cox, Leclerc, et al., 2010). Similarly, Hispanic unmarried men were more likely to use condoms with non-steady or casual partners than with their steady partners (Ibanez, Marin, Villareal, & Gomez, 2005). In a qualitative study, Hernandez, Zule, Karg, Browne, and Wechsberg (2012) reported that Hispanic female immigrants lacked accurate HIV and STI transmission knowledge. Among 253 young Asia Pacific Islander men living in the U.S., 33% reported to have unprotected anal intercourse in the past three months (Choi, Han, Hudes, & Kegeles, 2002). Similarly, among 144 Taiwanese immigrants living in the U.S., 28% reported to have never used condoms during their last sexual encounters (Lin, Simoni, & Zemon, 2005). A study on sexual and HIV risk behaviors among Central and Eastern European migrants in the U.K., showed that male migrants were more likely to report two or more partners in the past year, more likely to have paid for sex, and more likely to have injected drugs than the British nationals (Burns, Evans, Mercer, et al., 2011).

The association of migration with HIV infection is complex; however, Soskolne and Shatarkshall (2002) surmised a multilevel framework of association between immigration and HIV which includes structural or macro elements such as low socioeconomic status or lack of power of immigrants, intermediate level factors that limit social capital and interaction and increased isolation that may curb accessibility to resources, and individual factors that include cultural loss and bewilderment in the new environment and other migration stressors emanating from the daily challenges of limited resources. Moreover, limited cross-cultural communications

may further constrain accessibility to HIV prevention programs. Other individual level factors such as language and cultural barriers can also influence HIV prevention services and increase vulnerability to HIV infection (Soskolne & Shatarkshall, 2002).

Statement of the Research Problem

African-born immigrants are disproportionately affected by the HIV epidemic in the U.S. (Minnesota Department of Health, n. d.; Washington State Department of Health, 2010). The growing diversity of the infected population calls for culturally appropriate and tailored HIV prevention services (Minnesota Department of Health, 2010). A thorough review of literature did not reveal any studies that specifically examined the psychosocial determinants of condom use in East African communities in the U.S. under the framework of behavioral models that help predict factors that influence consistent condom use in steady heterosexual relationships. Moreover, there is a lack of research in understanding the mechanism through which acculturation influences health behavior such as condom use. The current study will fill the knowledge gap by providing a more thorough examination of psychosocial determinants of condom use and its association with acculturation and therefore provide valuable information that could be used to design tailored public health intervention in East African communities.

Theoretical Framework

Despite enormous progress made in improving the quality of life for people infected with HIV, so far there is no vaccine or cure. It is now increasingly recognized that the only effective way to reduce the transmission and impact of HIV is through effective prevention directed at changing behaviors (Fishbein, 2000). Theory-based intervention programs play a critical role in changing risky behaviors and thereby reducing the spread of HIV. A theory is defined as “set of

concepts, definitions, and propositions that present a systematic view of events or situations” (Glanz, Rimer, & Viswanath, 2008, p. 26). Sexual behavior, like condom use, is complex and is influenced by a myriad of factors (Eaton, Flisher, & Aaro, 2003; Jemmott et al., 2007). However, there are a limited number of theoretical variables that underlie any behavior (Fishbein, 2000). The Institute of Medicine (IOM, 2002) recommends the use of the Integrated Behavioral Model (IBM) for predicting health behaviors. IBM combines the constructs of Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Bandura’s Social Cognitive Theory (Montano & Kasprzyk, 2008). Moreover, the study sought to understand the relationship between constructs of IBM and acculturation. The evolution of IBM as a framework for health behavior research is presented in Chapter II.

Purpose of the Study

In addition to describing the demographic and sexual behavioral characteristics of East African immigrants in Minnesota, the purpose of this study was to examine the psychosocial determinants of condom use and their relationship to acculturation in influencing condom use in East African immigrants in Minnesota.

Definition of Terms

AIDS: Acquired Immunodeficiency Syndrome

HIV: Human Immunodeficiency Virus

Immigrant: A person who leaves one country to settle permanently in another (The FreeDictionary, 2011). There are four categories of immigrants in the U.S.: legal immigrants, refugees, asylees, and undocumented immigrants (Kandula, Kersey, & Lurie, 2004).

Legal immigrants: Individuals who have been granted permission by the Immigration and Naturalization Service to enter the U.S. either permanently or temporarily (Kandula, Kersey, & Lurie, 2004).

Asylee: A person who is fleeing his or her country because of persecution or war who enters the U.S. without legal permission but must apply for refugee status (Kandula, Kersey, & Lurie, 2004).

Refugee: “Any person who is outside their country of origin and unable or unwilling to return there or to avail themselves of its protection, on account of a well-founded fear of persecution for reasons of race, religion, nationality, membership of a particular group, or political opinion” (UN, 2008).

Undocumented immigrant: A person who does not have legal permission to be in the U.S. (Kandula, Kersey, & Lurie, 2004).

Steady relationship: In this study, steady relationship refers to a heterosexual relationship that is regular (married, unmarried or cohabiting) excluding casual sexual encounters.

Hypotheses

Attitudes, norms, and control factors are antecedents of intention to perform a behavior (Ajzen, 1991; Montano & Kasprzyk, 2008). Based on the literature, male condom use has been reported to be influenced by attitude, norms, perceived behavioral control, and self-efficacy, but the relative importance of these factors is specific to the population in question (Boer & Mashamba, 2005; Molla, Astrom, & Brehane, 2007; Sutton, McVey, & Glanz, 1999).

Consequently, the relationship between the independent variables (attitude, norms, and perceived behavioral control, self-efficacy, acculturation, and habit) and the dependent variables (intention

to use condoms and condom use) in steady heterosexual relationships among East-African immigrants were examined. It was hypothesized that more positive attitude, norms, perceived behavioral control, self-efficacy, acculturation, and habit will predict higher intention or condom use.

In addition, although the impact of acculturation on health behaviors is well documented (Abraido-Lanza, Armbrister, Florez, & Aquirre, 2006; Afable-Munsuz & Brindis, 2006; Marin, Gomez, & Tschann, 1993), the mechanism through which acculturation influences health behavior is less understood (Abraido et al., 2006; Afable-Munsuz & Brindis, 2006). Thus, it was hypothesized that higher acculturation levels will lead to more positive attitude and higher self-efficacy which in turn contribute to increased intention to use a condom. Finally, the applicability of the Integrated Behavioral Model (IBM) in explaining condom use behavior in East-African immigrants was tested with the hypothesis that the IBM adequately fits the sample data.

Significance and Rationale

It is evident that African-born immigrants are at increased risk of HIV infection in the U.S. (Minnesota Department of Health, n. d.; Washington State Department of Health, 2010). The main transmission route for HIV infection in this population is through unprotected heterosexual contact (Beckwith et al, 2009; Johnson, Hu, & Dean, 2010; Washington State Department of Health, 2010). With 80% of new HIV infections transmitted sexually worldwide, correct and consistent condom use is a critical element in preventing HIV infections (UNAIDS, 2009). Theory-based intervention programs play a significant role in changing risky behaviors and in reducing the spread of HIV. Identifying the determinants of condom use in specific populations is the first step in designing effective intervention strategies that can reduce the

acquisition and the spread of HIV. Moreover, the study contributes to the current literature by elucidating the mechanism through which acculturation influences condom use behavior in East-African immigrants.

In summary, African-born immigrants in the U.S. are at increased risk of HIV infection. The transmission of HIV among immigrant populations is mainly through heterosexual contact and many immigrants are being infected with the virus. While condom use is the most effective way of preventing the acquisition and spread of HIV infection, it is important to understand why consistent condom use has not been achieved to curb new HIV infections in these communities. Identifying key psychosocial determinants that influence condom use in East-African communities will provide information that can be used to design tailored intervention to increase the use of condoms and reduce the incidence of HIV infection in these communities.

CHAPTER 2: LITERATURE REVIEW

Immigrants and HIV Vulnerability

The unique cultural and socioeconomic realities of most immigrants in the U.S. put them at an increased risk of HIV infection (Del Amo, Broring, Hamers, Infuso, & Fenton, 2004; Rosenthal et al., 2003). Apart from language barriers to accessing health care services in the host countries, difficulty in abandoning traditional beliefs (Beyene, 2004; Drummond, Mizan, & Wright, 2008; Rosenthal et al., 2003) has also contributed to the vulnerability of immigrants. Generally, inadequate HIV knowledge, low HIV risk perception, stigma to HIV or AIDS, and lack of or inconsistent condom use are considered to be risk factors for HIV infections in immigrant communities (Beyene, 2004; Drummond et al., 2008; Knipper et al., 2007; Rosenthal et al., 2003). For example, increased vulnerability to HIV infection among Mexican immigrants is attributed to various factors including multiple sexual partners, low HIV knowledge, low rate of condom use, limited access to health services, and increased use of commercial sex workers (Albarran & Nyamati, 2011; Emilio, Chenoa, Flippen, & McQuiston, 2004; Magis-Rodriguez et al. 2009; Rhodes et al., 2010). Likewise, increased vulnerability to HIV infection among Haitian immigrants in Canada (Adrien et al., 2010), Hispanic men (Hall, Byers, Ling, & Espinoza, 2007), and Asian and Pacific Islander men (Choi, Wong & Sy, 2005) in the U.S. have also been reported.

Inadequate HIV Knowledge: Although awareness about HIV transmission is widespread in many sub-Saharan Africa countries, there are misunderstandings about HIV transmission and protection (Central Statistical Agency & ORC Marco, 2006; Mishra, Agrawal, Alva, Gu,

&Wang, 2009). For instance, many Ethiopian and Eritrean immigrants in the U.K. were found to have little understanding and misconceptions about the HIV epidemic in the U.K. stemming from a wrong perception that the risk for HIV infection in the U.K. is lower than in their home countries (Barrett & Mulugeta, 2010). In the same vein, Somali immigrants in Minnesota believe that HIV mostly impacts people who engage in adultery and that praying can help avoid infections and provide protection (Khaliq, 2004). In Denmark, a study assessing knowledge, attitude, and practices (KAP) among 192 Somali and Sudanese immigrants, Lazarus et al. (2006) reported that only 5% of Somali women, and 22% of Somali men had high knowledge about HIV transmission (individuals with high knowledge answered eight questions correctly out of eleven items). Similarly, low levels of knowledge about HIV transmission have been reported in Australia among West African immigrant women. For example, having oral or anal sex with HIV positive person was not recognized as a risk factor (Drummond, Mizan, & Wright, 2008). A survey among Sudanese immigrants in Nebraska (n=47) showed a significant knowledge gap in HIV transmission. For example, 55% thought that insects like mosquitoes can spread the disease. A similar proportion, believed that people can protect themselves by having sex with people who look healthy, and 28% believe that a person cannot get HIV when having sex for the first time (Tompkins et al., 2006).

Although according to the AIDS risk reduction model, knowledge of HIV is a prerequisite for recognizing risky behavior and taking action to change it (Fisher & Fisher, 1992), research findings regarding the relationship between knowledge and behavior have not been consistent. “Possession of accurate information is no guarantor of wise judgments, nor is misinformation necessarily a precursor of bad decision” (Ajzen, Joyce, Sheikh, & Cote, 2011, p.101).

In a meta-analysis, Sheeran, Abraham, and Orbell (1999) reported only a small correlation between HIV transmission knowledge and condom use. The authors attributed the small correlation to the inconsistencies in reliability and validity of instruments and lack of specificity in measuring HIV transmission knowledge in the literature. Many studies from different populations, however, did not reveal a significant association between HIV knowledge and condom use. For example, in a sample (n=498) of Chinese patients who were treated for sexually transmitted infections (STIs), HIV transmission knowledge was significantly associated with never using condoms (Wang, Jiang, Siegal, Falck, & Carlson, 2001). From a sample of 84 Chinese female sex workers, Hesketh Zhang and Qiank (2005) reported that 84% had a high level of HIV transmission knowledge, but only 32% reported to have always used condoms.

Similarly, in the U.S., DiClemente, Durbin, Siegel, Krasnovsky, and Lazarus (1992) and Swenson et al. (2010) did not find a significant association between HIV knowledge and condom use among junior high school students in inner-city settings and in low-income African American adolescents, respectively. In South Africa and the Ivory Coast, Makiwane and Mokomane (2010) and Zellner (2003), reported a lack of association between HIV transmission knowledge and condom use. Likewise, in Croatia, Stulhofer, Graham, Bozicevic, and Ajdukovic (2007), reported no association between HIV knowledge in both condom use at first and last intercourse among young adults. Knowledge may be a necessary, but insufficient condition to prevent HIV transmission (Dinkelman, Levinsohn, & Majelantle, 2006). For example, although women in Botswana had high level of awareness about HIV transmission, they were unable to use this knowledge to protect themselves against HIV infection (Dinkelman et al., 2006). DiClemente et al. (1992) recommends the use of interactive information delivery as opposed to the deductive transfer of information to increase adolescent attitude towards condom use.

Low HIV Risk Perception: Health risk is defined as “perception of the subjective likelihood of the occurrence of a negative event related to health for a person or group of people over a specified time period.” (Menon, Raghubir, & Agrawal, n.d., p.2). Persons with low perceived risk for HIV may therefore engage in risky sexual behavior. For example, the perceived “low-risk environment” of HIV in the U. K. may partially explain why many Ethiopian and Eritrean immigrants have not used condoms during sexual activities in the U. K. (Barrett & Mulugeta, 2010). Similarly, in the U.S., in a study involving 309 African immigrants, 79.5% reported low self-perceived risk for contracting HIV while at the same time, 36.3% never used condoms (Rosenthal et al., 2003).

In a qualitative study among Ethiopian and Eritrean immigrants in California, Beyene (2004), reported high level of awareness about HIV infection and transmission, but individuals failed to fully recognize their own risks. For example, many Ethiopian and Eritrean immigrants in the U.S. believe that HIV infection is limited to certain populations such as prostitutes, drug users, and homosexuals, and that heterosexual transmission of HIV is a problem only in Africa (Beyene, 2004). In a qualitative study involving a diverse group of African immigrants in Canada, Omorodion, Gbadebo, and Ishak (2007), reported that many participants believe that the Canadian Immigration Service only awards visas to healthy migrants, prompting the presumption that their sexual partners are healthy, thus downplaying the need for safer sex.

Stigma Associated with HIV or AIDS: Most African immigrants are not willing to even talk about HIV or AIDS, and often show anxiety about HIV testing (Beyene, 2004; Barrett & Mulugeta, 2010; Khaliq, 2004). For example, many Ethiopian and Eritrean immigrants in California do not want to know if they are infected with HIV because of fear of isolation and rejection in their community (Beyene, 2004). People who have tested positive frequently keep

their HIV status private (Beyene, 2004). Similarly, in Minnesota, Somali immigrants described HIV or AIDS as a killer disease, and often patients do not talk about the disease for fear of exposing their status. If their status is known, patients will suffer isolation and rejection as the rumors quickly spread through the community (Khaliq, 2004). In the U.K, a similar situation was reported among Ethiopian and Eritrean immigrants (Barrett & Mulugeta, 2010). The negative attitude towards HIV-positive people can undermine HIV prevention efforts (Barrett & Mulugeta, 2010). Moreover, the stigma attached to HIV may delay testing and subsequent treatment that can reduce chances for survival among people infected with HIV (Crawford, Caldwell, Bush, Browning, & Thornton, 2011). For example, a comparative analysis of HIV and AIDS characteristics among foreign and U.S. born individuals (Crawford et al., 2011) reported that foreign-born patients enrolled into care at lower CD4+ count than their U.S. born counterparts. Foreign-born patients were also more likely to be diagnosed with multiple opportunistic infections as compared to the U.S. born patients (Crawford et al., 2011).

Lack of or Inconsistent Condom Use: It is now clear that the only effective way to prevent the transmission and infection of HIV is through behavior change (Bennett & Bozionelos, 2000; Fishbein, 2000). Consistent condom use is an important strategy for preventing the spread of HIV. Hearst and Chen (2004) reported that condoms are 90% effective in preventing HIV transmission. Consistent and correct condom use significantly reduced the risk of HIV transmission in serodiscordant couples (UNAIDS/WHO, 1998) and is an effective way to prevent the transmission of HIV and other sexually transmitted infections (Cates, 2001). Condoms provide protection against HIV if used consistently and correctly (Hearst & Chen, 2004). In KwaZulu-Natal, South Africa, only 14% of men and 17% of women reported consistent or occasional condom use in long term relationships (Maharaj & Cleland, 2004). In

Ethiopia and Kenya, only 30% and 21.4% of adults have ever used condoms, respectively (Belachew, 2002; Cherutich, Brentlinger, Nduati, Kiarie, & Farquhar, 2008). Similarly, condom use among African immigrants in Western countries including the U.S. is low (Barrett & Mulugeta, 2010; Lazarus et al., 2006; Rosenthal et al., 2003; Tompkins et al., 2006). Among Somali and Sudanese immigrants in Denmark, Lazarus et al. (2006) reported that one-third of women participants in their study had never heard of or seen condoms. Participants also showed negative attitude towards condom use. For example, to the question “condoms make sex less enjoyable”, 60% of men and 20% of the women responded “yes”. Condom use as a barrier to sexual gratification is frequently reported in the literature (Barrett & Mulugeta, 2010; Sunmola, 2005). Similarly, West African immigrant women in Australia showed negative attitudes towards condom use, associating it with shame and sexual promiscuity (Lemoh, Biggs, & Hellard, 2008). Introducing condoms in a relationship often connotes lack of trust and sign of promiscuity (Maharaj & Cleland 2004; Maharaj, 2005; Warren & Philpott, 2003). In Malawi, the use of condoms in a marriage is considered as an intrusion to the integrity of the marriage (Chimbiri, 2007).

Gender inequality also contributes to inconsistent or lack of condom use among immigrants residing in Western countries (Barrett & Mulugetta, 2010; Foley, 2007; Omorodion, et al., 2007). “Residency in modern developed society does not eliminate the influence of patriarchal and oppressive cultural values, norms, and beliefs that subordinate women and make them powerless,” (Omorodion et al., 2007, p. 435). For example, among Ethiopian and Eritrean immigrants in the U.K., it is difficult for women to negotiate safer sex. Women who provide condoms are labeled as promiscuous or prostitutes because it is against the traditional male sexual domination role (Barrett & Mulugetta, 2010). In other words, women have very little

power to negotiate safer sex with their male partners, increasing their vulnerability to HIV infection (Foley, 2005). Religious beliefs could also play a role in condom use. In general, religious leaders in sub-Saharan Africa promote abstinence and faithfulness as opposed to condom use (Trinitapoli, 2009). A qualitative and quantitative study of 187 religious leaders of different dominations in Malawi (Trinitapoli, 2009) reported that only 27% of religious leaders advised their congregations to use condoms. In contrast, 95% of religious leaders advised their members against promiscuity (Trinitapoli, 2009). Pope Benedict's remark in his recent tour to Africa is a good example that religious organizations are against the use of condoms. The Pope described the HIV epidemic in Africa as, "tragedy that cannot be overcome by money alone that cannot be overcome through the distribution of condoms, which can even increase the problem" (BBC, 2009). In summary, immigrants, in general, and African-born in particular, are vulnerable to HIV infection. A complex interplay of factors influence individuals to engage in behaviors and activities that place them at increased risk of HIV infection. These factors are important in influencing health behaviors, but are considered *distal* in the assumption of IBM, and thus are assumed to have little direct influence on condom use.

Determinants of Condom Use

Psychosocial Factors: Theory-based intervention programs play a critical role in changing risky behaviors. Sexual behavior, like condom use, is complex and is influenced by a myriad of factors (Eaton, Flisher, & Aaro, 2003; Jemmott et al., 2007). However, there are a limited number of theoretical variables that underlie any behavior (Fishbein, 2000). The Institute of Medicine (IOM), (2002) recommends the use of IBM for predicting health behaviors. IBM combines the constructs of Theory of Reasoned Action (TRA), Theory of Planned Behavior

(TPB), and Bandura's Social Cognitive Theory (Montano & Kasprzyk, 2008). In the following section, the evolution of IBM as a framework for health behavior research is presented.

Theory of Reasoned Action (TRA): The TRA was developed from early work on attitude and behavior prediction (Fishbein, 1967). The cornerstone of TRA is behavioral intention posited to mediate the attitude-behavior relationship (Fishbein & Ajzen, 1975). The TRA assumes that people are rational and take into consideration the consequences of their action before performing a behavior (Fishbein & Ajzen, 1975). Furthermore, TRA asserts that a behavior or an action is under volitional control of the person who is performing the behavior (Fishbein & Ajzen, 1975; Ajzen, 1991). In TRA (Fishbein & Ajzen 1975), the antecedent of any behavior is the intention to perform a behavior. According to Ajzen (1991) intention captures the motivational factors that influence a behavior and indicates how hard people are willing to try and how much efforts they are willing to exert. In other words, the stronger a person's intention, the more likely one performs the behavior (Ajzen, 1991).

In TRA, intention to perform a behavior is a function of personal factors and social influences (Fishbein & Ajzen, 1975). Personal factor refers to attitude toward a behavior, which is overall favorableness or unfavorableness towards performing a behavior. This also encompasses individuals' beliefs about the outcome of performing the behavior and the evaluation of those outcomes (Ajzen, 1991; Ajzen, 2002; Fishbein & Ajzen, 1975; Fishbein 2000). Social influences (subjective norms) refer to the perceived social pressure from significant others to perform or not perform a behavior, and are considered to be independent from attitude in influencing the intention to perform a behavior (Fishbein & Ajzen, 1975). According to TRA, attitudes are formed from beliefs. A person, who believes performing a behavior will result in a positive outcome, will espouse favorable attitude toward a behavior in

question (Armitage & Christian, 2004; Fishbein & Ajzen, 1975). Thus, attitude toward a behavior is formed by the underlying behavioral beliefs and their evaluation (Armitage & Christian, 2004; Fishbein & Ajzen, 1975). Likewise, subjective norms are also formed by the underlying normative beliefs and the motivation to comply with social pressure from relevant referents (Armitage & Christian, 2004; Fishbein & Ajzen, 1975).

Theory of Planned Behavior (TPB): Fishbein and Ajzen (1975) asserted that the TRA applies to behaviors under volitional control. In order to predict those behaviors that are not fully under volitional control, Ajzen and Madden (1986) introduced the Theory of Planned Behavior (TPB) to account for non-volitional behaviors. TPB is essentially an extension of TRA but includes a new concept, perceived behavioral control (PBC), as a predictor of intention or behavior (Ajzen 1991; Ajzen & Madden, 1986). PBC measures the degree of perceived behavioral control and is “the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles” (Ajzen, 1991, P.188). In TPB, the more one has a favorable attitude and subjective norms, and the stronger the perceived behavioral control, the more likely an individual intends to perform the behavior in question (Ajzen, 1991). Intention is therefore expected to vary depending on the relative importance of attitude, subjective norms, and perceived behavioral control in predicting intention across different behaviors and situations (Ajzen, 1991; Armitage & Christian, 2004).

Similar to attitude and subjective norms, control beliefs underlie perceived behavioral control. For example, the more resources and opportunities at an individuals’ disposal, and the fewer constraints they anticipate, the greater the perceived control over the behavior and the greater the likelihood that they will perform the behavior (Ajzen, 1991).

Integrated Behavioral Model (IBM): The existing social cognitive theories suggest that only a limited number of psychosocial constructs serve as determinants of any behavior including sexual behavior, and understanding the role of these constructs can help guide interventions (Fishbein, 2000). In IBM (Fishbein, 2000; IOM, 2002; Montano & Kasprzyk, 2008), a behavior is likely to be performed if the individual has strong intention, has the skills, and faces no environmental constraints that prevent him/her from performing the behavior, the behavior is salient, and has been performed previously (see Figure 3). The model also suggests that there are three primary determinants of intention: (1) attitude toward a behavior (overall favorableness or unfavorableness towards performing a behavior) which also reflect an individual's beliefs about the outcome of performing the behavior and the evaluation of those outcomes (Ajzen, 1991; Fishbein 2000; Ajzen, 2002); (2) perceived norms, pertaining to the perceived social pressure on individuals to engage or not to engage in a behavior (Fishbein, 2000); and (3) personal agency, the belief that one has the skills and abilities to perform a behavior (IOM, 2002). This consists of self-efficacy which is a belief that one can perform a certain behavior even under difficult circumstances (Bandura, 1986; Bandura, 1994), and perceived control, the perception that performance of a behavior is under one's control (Ajzen, 1991; Montano & Kasprzyk, 2008).

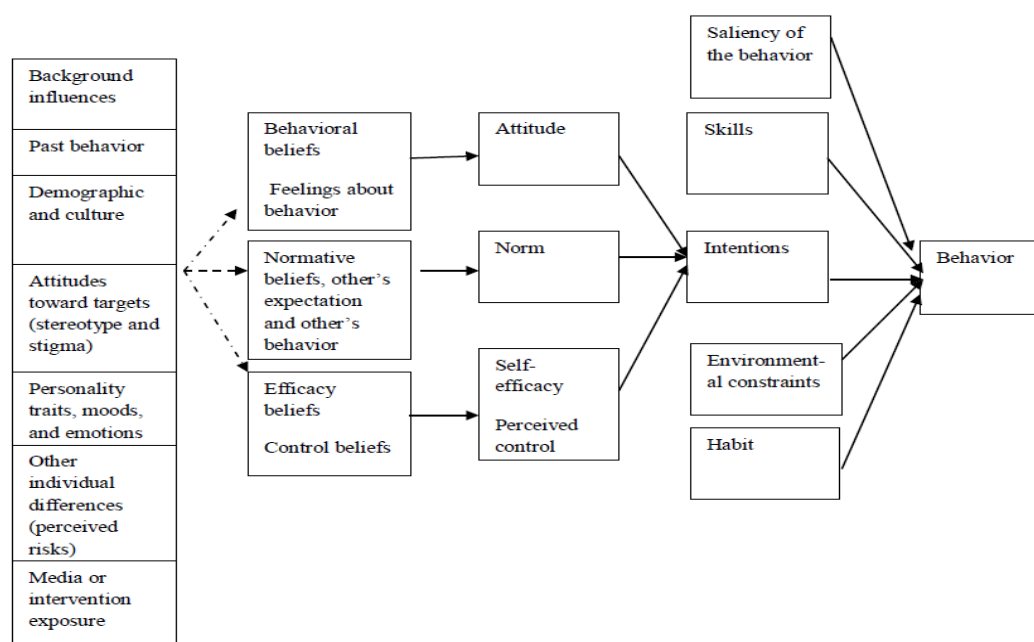


Figure 3. Integrated Behavioral Model (Fishbein, 2000; IOM, 2002; Montano & Kasprzyk, 2008)

The intention to perform a behavior captures the motivational factors that influence a behavior and refers to how hard people are willing to try and how much effort they are planning to exert (Ajzen, 1991; Ajzen 2002). The core determinant of performing a behavior in IBM is the intention to perform a behavior (Fishbein, 2000; IOM, 2002; Montano & Kasprzyk, 2008). However, IBM also posits that even if people have strong intentions, they may lack the necessary skills or abilities to perform the behavior (Fishbein, 2000; IOM, 2002; Montano & Kasprzyk, 2008). Moreover, environmental factors may facilitate or impede the performance of behavior even if a person has strong intention (Fishbein, 2000; IOM, 2002).

Variables shown on the left side of the model can also influence individuals' beliefs about a given behavior (see Figure 3). Demographic variables such as gender, ethnicity, age, education, and socio-economic status can influence a behavior. Likewise, people who perceive

that they are at high risk for a certain disease may have different beliefs about certain behavior as compared to people who think they are not at high risk. Factors such as perceived risks, personality traits, moods, culture, knowledge, stigma, media exposure, availability of health services, and interpersonal relationships may influence beliefs about performing a behavior (IOM, 2002). These variables are *distal* variables and exert their influence on a behavior through *proximal* variables (IOM, 2002). *Proximal* variables are the direct antecedents of intention (attitude, norms, and control factors). *Distal* variables are also called *external* variables (Fishbein & Ajzen, 1975). “*External* variables will have an effect on behavior only to the extent that it influences the determinants of that behavior” (Fishbein & Ajzen, 1975, p. 9).

In IBM, attitude is differentiated into affective and cognitive dimensions (Montano & Kasprzyk, 2008). Affective attitude refers to the emotional response to performing a behavior in question. Instrumental attitude is cognitive and is influenced by beliefs about the outcome of a behavior to be performed (Montano & Kasprzyk, 2008). French et al. (2005) who measured both dimensions of attitude recommends measuring of affective and instrumental attitudes as separate constructs. Similarly, perceived norms, the social pressure exerted by significant others (Ajzen, 1991; Fishbein, 2000), is also differentiated into injunctive and descriptive norms. Fishbein (2000) argues that subjective norms as described in TRA/TPB is in fact injunctive norms, a belief about what significant others think one should do and the motivation to comply, but this may not fully tap into the normative influence. Thus, the perceptions about what significant others themselves are doing (descriptive norms) are also important in exerting normative influence (Fishbein, 2000) are included in IBM. Having discussed the pertinent health behavior theories and their associated constructs, in the following section, psychosocial factors and their relative importance in different populations as it relates to condom use are presented.

Psychosocial Factors: Overall, the stronger the intention, the more likely a person will perform a behavior (Ajzen, 1991; Ajzen, 2002). Bennett and Bozionelos (2000) reported a positive correlation in the range of $r=.16$ and $.52$ between intention and actual condom use while in a meta-analysis, Albarracin, Fishbein, and Muellerleile (2001) reported a correlation of $.45$ between intention and condom use. A higher correlation of $.53$ between intention and behavior was also reported (Sheppard, Hartwick, & Warshaw, 1988) indicating that intention can predict future behavior. A meta-analysis of 47 experimental studies on intention-behavior relationship, Webb and Sheeran (2006) reported a significant causal association between intention and behavior and reported that a change in intention ($d=.66$) led to a change in behavior ($d=.36$). The antecedents of intention are attitude, norms, perceived behavioral control, and self-efficacy. However, their relative importance depends on the behavior and the population under study (Fishbein, 2000). For example, stronger intention to use condoms was significantly associated with more positive attitude and subjective norms, and greater self-efficacy in a sample of English youth (Sutton, McVey, & Glanz, 1999). Similarly, among 802 rural Ethiopian residents Molla, Astrom, and Brehane (2007) reported a significant correlation between subjective norm and intended condom use ($r = .64$) and between attitude and intention to use condoms ($r = .66$). Another study ($n=200$) of low-literate women in Ethiopia, intended condom use was significantly and positively related with attitude to use condoms and self-efficacy. Subjective norms were not related to intended condom use (Bogale, Boer, & Seydel, 2010). In South Africa ($n=195$) attitude to condoms and subjective norms were significantly and positively related to intended condom use in men, and attitude and self-efficacy were significantly and directly related to intended condom use in women (Boer & Mashamba, 2005). Intention to use condoms was significantly related to greater self-efficacy, and more positive attitude and subjective norms,

in a sample of 15,782 of young people in South Africa and Tanzania (Schaalma et al., 2009). In another cross-sectional study in South Africa (n=390 adolescents) attitude and perceived behavioral control (perception of the ease or difficulty of performing a behavior) (Ajzen, 1991) significantly related to intention to use condoms but subjective norms were not related to intended condom use (Jemmott et al., 2007). However, Bosompra (2001) found subjective norms as the most important determinant of condom use among university students in Ghana. Nonetheless, Bennett and Bozionelos (2000) concluded that attitudes and self-efficacy constructs are more powerful than social norms and perceived control factors, respectively, in predicting intended and self-reported condom use. In a meta-analysis, Armitage and Conner (2001) also reported subjective norms as the weaker predictor of intention. In general, these studies suggest that the constructs of social cognitive models are useful in understanding the correlates of condom use. If these variables significantly predict condom use behavior in East-African immigrants, then it is logical that future research can be directed at those variables for promoting a widespread use of condoms in East-African communities in Minnesota.

Acculturation: Is defined as “acquisition of the cultural elements of the dominant society” (Lara, Kahramanian, Morales, & Bautista, 2005, p. 369). Acculturation has been found to be correlated both with health risk factors and health protective behaviors (Anders, 2010; Santelli, Abraido-Lanza, & Melnikas, 2009). For example, increased level of acculturation was associated with higher risks of cardiovascular diseases (Koya, & Egede, 2007; Lutsey et al., 2008; Steffen, Smith, Larson, & Butler; 2006) and substance use and abuse (Myers, et al., 2009; Koneru, Mamani, Flynn, & Betancourt, 2007). However, increased acculturation was also associated with more physical activities among Latinos in the U.S. (Abarido-Lanza, Chao, & Florez, 2005; Lassetter & Callister, 2009). Although higher levels of acculturation were also linked to some

risky sexual behaviors such as early sexual initiation and increased sexual activities among Latinos (Ford & Norris, 1993; Santelli, Abraido-Lanza, & Melnikas, 2009), it was also related to more condom use (Afable & Brindis, 2006; Marin, Tschann, Gomez, & Kegeles, 1993) and increased utilization of health services (Lara et al., 2005; Salant & Lauderdale, 2003).

Generally, there are two theories that are employed to explain the relationship between acculturation and health behaviors (Afable & Brindis, 2006; Salant & Lauderdale, 2003). The acculturation stress model (Berry, 1980), explains the negative health outcomes as response to the stress that accompanies the process of adapting into a new or different culture. Whereas the life style change model (Salant & Lauderdale, 2003) attributes the declining health with higher acculturation levels to immigrants adopting unhealthy lifestyle of the host culture. However, for condom use behavior, both models seem to be inadequate in explaining why higher acculturation level positively influenced condom use. An alternative explanation would be that increased acculturation may be related to better use of preventive and healthcare services (Lara et al., 2005; Shi, Lebrun, & Tsai, 2009; Unger & Molina, 2000). Moreover, increased level of acculturation also entails increased language proficiency that may improve access to health education and easy navigation of the healthcare system (Unger & Molina, 2000). Although the influence of acculturation on health behaviors is well established (Afable & Brindis, 2006; Lara et al., 2005; Salant & Lauderdale, 2003), the existing social cognitive theories, have not considered acculturation as a direct antecedent of a behavior (Bandura 1986; Bandura, 1994; Fishbein, 2000). Thus, the mechanism through which acculturation influences health behaviors is not well understood (Abraido-Lanza et al., 2006). Understanding how acculturation influences condom use behavior among East-African immigrants could be useful in designing interventions that are culturally tailored to the study population.

Previous Condom Use: Past condom use has been reported to directly influence the subsequent use of condoms (Albarracin et al., 2001; Fekadu & Kraft; 2001; Reinecke, Schmidt, & Ajzen, 1996). However, few behavioral models have attempted to include past behavior or habit as direct determinant of a behavior. In his model, Triandis (1977) hypothesized behavior as a function of habit, intention, and facilitating conditions. Furthermore, he asserted that novel behaviors are mainly determined by intentions while repeated behaviors are primarily influenced by habit. In other words, when behaviors are repeated, they become habitual and their performance will depend less on conscious or planned decisions. Thus, habits moderate the association between intention and behavior (Trafimow, 2000). When people have not performed the behavior in the past, attitude and subjective norms predict intentions, and in contrast, if the behavior is repeatedly performed and habits developed, the predictive power of attitude and subjective norms would decrease (Trafimow, 2000). In a meta-analysis, Gardner, Bruijn, and Lally (2011) also reported the moderator effect of habit in intention-behavior relationship. In a study involving condom use among college students in the U. S., Trafimow (2000) reported that among participants who had developed a habit of using condoms, their attitudes towards condom use and subjective norms were not significant predictors of intention to use condoms. Past behavior of condom use was also found to be the strongest predictor of non-condom use among a sample of university students in the U. K. and Greece (Protogerou & Tuner-Cobb, 2011). Similarly, Reinecke, Schmidt, and Ajzen (1996), found a substantial improvement in variance explained in intention to use condom when past condom use was added to the constructs of TPB (84% vs. 30.0%), although Fekadu and Kraft (2001) reported much smaller (8%) increase in variance accounted by previous contraceptive use in a sample of Ethiopian women.

Independent contribution of past behavior on future behavior has also been reported elsewhere (Conner & Armitage, 1998; Sutton et al., 1999). Overall, if habits are developed for a behavior, there is less effort required for planned deliberate actions as needed in TRA/TPB to perform a behavior (Trafimow, 2000). “Clearly, past behavior does not cause subsequent behavior. However, frequent performance of a behavior may bring subsequent behavior under the control of habitual processes, although a behavior does not necessarily become habitual just because it has been performed many times” (Conner & Armitage, 1998, p. 1436). Performing a behavior previously would require less cognitive effort to form an intention than generating a new behavioral intention (Sutton et al., 1999). When taken together, these findings suggest that examining this variable is reasonable in order to better understand condom use behavior in East-African immigrants. If habit significantly predicts condom use, then future studies can be directed on ways to develop habit and promote condom use behavior in the study population.

In summary, with condom use being the central strategy for preventing HIV infection, literature pertinent to factors that influence condom use have been discussed. Generally, psychosocial factors (attitude, norms, and control factors), acculturation, and habit were reported to have exerted significant influence on condom use behavior although their magnitude and relative importance were specific to the population studied. The focus of the current study is therefore, to identify the relevant psychosocial factors that influence condom use in East-African populations, examine how acculturation influences condom use, and test if the sample data fit the hypothesized model.

CHAPTER 3: METHODS

Overview

Identifying determinants of condom use in a specific population is the first step in designing effective interventions. The hypotheses were to test the association between the main independent variables (attitude, norms, perceived behavioral control, self-efficacy, acculturation, and habit) and dependent variables (the intention to use condoms and self-reported condom use). In addition to testing the plausibility of the Integrated Behavioral Model (IBM), the role of attitude and self-efficacy in mediating the relationship between acculturation and behavioral intention to use condoms in heterosexual relationships in East-African immigrants was also examined. The study was conducted in two sequential phases: the elicitation (Phase I) and the cross-sectional quantitative survey (Phase II).

Population: In the past decades, thousands of immigrants have arrived in Minnesota. In 2007, there were 334,000 immigrants representing 6.5% of the state's population, far below the 13% of the immigrants accounted for nationally. During the same period, refugees accounted for 23% of immigrant population in Minnesota, larger than the 17% they represented in the U.S. (Fennelly & Huart, 2009). There are 70,000-80,000 foreign-born African immigrants living in Minnesota (Remington, 2008). The state is home for the largest Somali immigrant community in the U. S. (Ronningen, 2006) with estimated 32,000 refugees from Somalia currently living in Minnesota (Williams, 2011). Moreover, an estimated 7500 Ethiopian immigrants also reside in the state (Ronningen, 2006). Immigrants live in large numbers both in urban centers like Minneapolis/St. Paul metropolitan area and in rural areas of Minnesota. African-born immigrants work mainly in low paying and unskilled jobs such as baggage handlers or parking attendants at the airport, and in retail stores, or as taxi drivers in urban areas. In rural Minnesota, African immigrants work mainly in meat processing plants (Remington, 2008). Thirty-five percent of

African immigrants have English language barrier (Remington, 2008). The unemployment rate among African immigrants is higher (11%) than the average unemployment rate of 5.5% in Minnesota (Minnesota Department of Employment and Economic Development, 2013; Remington, 2008). The median household income for an African immigrant is \$31,641, well below the annual median household income of US \$58,756 in Minnesota (U.S. Census Bureau, 2013; Remington, 2008). Moreover, 29% of immigrants and their children live in poverty in Minnesota only eclipsed by Arizona with 37% of its immigrant populations impoverished. As the result, 48% of immigrant households receive some form of government assistance such as Medicaid, food stamps, or subsidized housing—the highest in the nation (Camarota, 2012).

Settings: Study participants were recruited from two sites: Minneapolis/St. Paul metropolitan and a site outside metro area. The Minneapolis/St. Paul metropolitan area has a population of 3.2 million with one-fifth of the metro residents living in the two major cities, Minneapolis and St. Paul (Berg, 2010). Residents of Minneapolis and St. Paul are multicultural with non-Hispanic whites comprising about two-third of the population; the rest are minorities (Berg, 2010). However, both cities have peculiar ethnic compositions with city of Minneapolis having larger black populations than St. Paul while the city of St. Paul has larger Asian residents than Minneapolis (Berg, 2010). Moreover, 19% and 23.4% of residents in Minneapolis and St. Paul, respectively, do not speak English at home (Berg, 2010). About one-fifth of the residents live in poverty in both cities. The median annual income estimates for 2005-2009 was about US \$46,000, far below the average for all residents of Minnesota (Berg, 2010; U.S. Census Bureau, 2013). Participants were also recruited from a small town outside the metro area in southern Minnesota. The town had 39,528 residents in 2011 of whom 90% were non-Hispanic whites. Blacks, Asians, Hispanics, and Native-Americans accounted for 4%, 2.8%, 2.9%, and .3%,

respectively (U.S. Census Bureau, 2013). Estimates for 2007-2011, showed that foreign-born persons accounted for 5.4% of the city's population while 8% did not speak English at home (U.S. Census Bureau, 2013). During the same period, 27% of the residents in the city lived below poverty level— more than double the poverty level in Minnesota (U.S. Census Bureau, 2013). Moreover, residents had only two-thirds of the median household income in Minnesota (U.S. Census Bureau, 2013).

Phase I: Elicitation

Behavioral, normative, and control beliefs are varied and specific to the population and the behavior in question. To identify these beliefs, it is important to first go to the study population and elicit relevant health beliefs, facilitators, and constraints to condom use (Fishbein, 2000). Generally, behavioral theories have common constructs that can be applied to different populations, but the relative importance of each construct is specific to the study population (IOM, 2002). "Salient beliefs are those that first come to mind when respondents are asked open-ended questions" (Sutton et al., 2004, p. 63) and can be identified in the elicitation study. Once, behavioral, normative, and control beliefs specific to the population are identified, measures of constructs of interest can be formulated in subsequent quantitative studies. Furthermore, it is the elicitation that makes a theory cross-culturally valid (Fishbein, 2000). The elicitation phase was conducted with a purpose of gathering information on behavioral, normative, and control beliefs as they pertain to a condom use with a steady partner in heterosexual relationships. Information from the elicitation phase was later used to develop a questionnaire for the quantitative survey (Phase II).

Participants: For the elicitation phase, a sample of 33 individuals from East-African immigrants, 16 (48.5%) Somalis and 17 (51.5%) Ethiopians were recruited from Minneapolis/St.

Paul metropolitan area (18 or 54.5%) and a site outside the metro area in southern Minnesota (15 or 45.5%). Seventeen (51.5%) were men and 16 (48.5%) were women. The average age of participants in the elicitation study was 28 years (range 20-53 years). On average, participants lived in the U.S. for nine years (range 1-21 years) and had attained eleven years of formal education. Participants, who self-identified as Somali or Ethiopian immigrants, were 18 years or older, and lived in Minnesota for at least six months were included in the study.

Measures: In the elicitation phase, in a self-administered questionnaire, participants self-reported demographic information including: age, gender, education, years lived in the U.S., and place of birth. Furthermore, participants answered open-ended questionnaires that included questions such as what they like or dislike, advantages and disadvantages, what makes hard or easy, what individuals or groups support or against, and what would help them overcome barriers to using condoms with their steady partners in heterosexual relationships (see Appendix A).

Procedure: Because the study did not seek to collect information that personally identified participants and was anonymous survey, exemption from IRB review was requested. The exemption was granted by the Institutional Review Board of The University of Texas at El Paso. Study participants were then actively solicited at public venues such as mosques, local cafes, and restaurants at both sites. Participants who met the inclusion criteria and gave verbal consent were provided with a research briefing. In the research briefing, rights of the participants to withdraw from the study at any time, assurance of confidentiality and the risks and benefits of taking part in the study were clearly stated and explained. Then, the questionnaire, in English language, was administered individually to each participant in a private setting at a time and place of participants' preference. The questionnaire took about 15 minutes to complete. This phase of the study was conducted April-May of 2012 and no monetary incentives were provided.

However, participants were thanked for their participation. Data collected from study participants were stored on a password protected computer and questionnaires containing participants' responses were locked in a secured cabinet and access limited to the researcher. All participants were provided with contact information of the researchers and the IRB office of The University of Texas at El Paso.

Approach to Analysis: Responses of the participants in the elicitation phase were listed under each construct and grouped into themes. Beliefs, referents, and control factors gleaned in the elicitation were utilized to develop a questionnaire for the subsequent quantitative cross-sectional survey (Phase II). The following is example of how responses of the participants were grouped into themes (Table 2) and later tallied (Table 3). In measuring affective attitude, for example, eight themes were used to construct eight items. All of the four frequent themes mentioned by participants and additional four less frequently mentioned themes were finally used to develop items for assessing affective attitude in Phase II.

Phase II: Cross-sectional Survey

Participants: Similar to the study population in Phase I, study participants were Somali or Ethiopian immigrants, both men or women, 18 years or older who lived in Minnesota for at least six months. Of 425 immigrants solicited for this study, 205 (48.2%) agreed to participate. Data on four participants were later removed due to presence of univariate or multivariate outliers. Thus, the final sample size used for analyses was 201.

Power and Sample Size: Using Statistics Calculator Version 3.0, apriori power analyses were conducted for hierarchical multiple regressions. In a meta-analysis, Scott-Sheldon et al. (2011) reported small to medium size effects ($d=.16-.46$) for sexual behaviors. When the number of predictors being tested and number of predictors in the regression models at each step were

considered, a sample size of 201 was sufficient to detect small to medium size effects with alpha level=.05 and power $(1-\beta) = .8$. Fritz and Mackinnon (2007) also provided sample size with power $(1-\beta) = .8$ to detect various effect sizes for mediational analyses. When bias-corrected bootstrap technique was used to assess statistical significance of indirect effects, a sample size of 148 was sufficient to detect a medium size of indirect effect. In structural equation modeling large sample size is often required. Kline (2005) considers a sample size greater than 200 as large. A sample size of 200 is considered sufficient for running structural equation models (Weston, Chan, Gore, & Catalano, 2008).

Table 2
Participants' responses: affective attitude (elicitation)

Responses	Themes
Reduce pleasure.	Reduce pleasure
Feel irritation and not comfortable.	Uncomfortable
My husband does not like me if I use condom.	Partner disapproval
Gives me a piece of mind –of contracting diseases.	Sense of safety
Reduce the pleasure and sexual gratification.	Reduce pleasure
Reduce pleasure.	Reduce pleasure
I feel safe about using condom because the person I am with may be infected.	Sense of safety
It does reduce the enjoyment I need.	Reduce pleasure
Using condoms means less feeling or sensitivity.	Reduce pleasure
Less pleasure or feeling.	Reduce pleasure
According to Islamic believes, I only can have intercourse with my wife and in that case I don't need to use condom.	Committed relationship
Reduce sexual satisfaction/gratification.	Reduce pleasure
It is unnatural.	Unnatural
Reduce sexual pleasure.	Reduce pleasure
Reduce sexual gratification.	Reduce pleasure
I think it is safer than anything else.	Sense of safety
It doesn't feel like the same as when you do without it.	Unnatural
It is against my religion.	Against my religion
Sex with condom doesn't feel as good as without it.	Reduce pleasure
Condoms minimize pleasure.	Reduce pleasure
Safety with using condoms.	Sense of safety
My partner doesn't like it.	Partner disapproval
Sometimes my partner might enjoy or like, and I wouldn't like it.	Reduce pleasure
My partner does not like it.	Partner disapproval
It is against by religion.	Against my religion
Sex with the condom keeps me on the save side.	Sense of safety
It is against my religion.	Against my religion
It is unnatural.	Unnatural
One doesn't get the whole sexual feeling.	Reduce pleasure
It is against my religion.	Against my religion
It is a good practice of save sex	Sense of safety
Condom ruins the mood.	Interruption
I feel uncomfortable using a condom.	Uncomfortable
It is complex using it.	Complex to use
Hard to climax.	Reduce pleasure

Table 2 Cont'd

Participants' responses: affective attitude cont'd (elicitation)

Response	Themes
It creates more problems and issues between me and my partner.	Creates trust issues
Partner may think you're avoiding having children by him.	Create trust issues
Creates distrust and doubt between my partner and I.	Create trust issues
Against my religion	Against my religion
I don't have any dislike. I always use condom.	-
Condom use is a safe sex.	Sense of safety
It could break, I can't really trust it.	Cannot trust condom
The feeling is not right.	Unnatural
It ruins the mood.	Interruption
Lowers satisfaction.	Reduce pleasure
Don't like it because it feels unnatural.	Unnatural
I don't feel I'm having sex.	Unnatural
Sex with condom feels bad and ruins the mood	Reduce pleasure & interruption
Both of us don't feel comfortable.	Uncomfortable
She does not feel me and the warmness of ejaculate.	Partner pleasure
Reduce pleasure	Reduce pleasure
My culture is for procreation and use of condom is looked down upon.	Against my culture
Cultural perception –condom use is associated with promiscuous people.	Associated with promiscuity
Condom promotes/facilitates illegitimate sex	Associated with promiscuity
Against my cultural values.	Against my culture
Reduces sensation.	Reduce pleasure
Our religion doesn't allow us to use condoms.	Against my religion
Our cultural beliefs are against it.	Against my culture
I don't think it has any advantage	-
Embarrassing to use condoms.	Embarrassing
Embarrassing	Embarrassing
Sex feels uncomfortable.	Uncomfortable

Table 3

Summary of the themes: affective attitude (elicitation)

Themes	Frequency
Reduce pleasure	18
Uncomfortable and unnatural	10
Sense of safety	7
Against my religion	6
Against my culture	3
Interruption	3
Creates trust issues	3
Partner disapproval	3
Embarrassing	2
Associated with promiscuity	2
Reduces partner sexual pleasure	1
Complex to use	1
Condoms cannot be trusted	1
Committed relationship	1

Design: The study design was cross-sectional. The dependent variables were behavioral intention to use condoms and self-reported condom use. The main independent variables include attitude (affective & instrumental), injunctive norms, descriptive norms, perceived behavioral control, self-efficacy, acculturation, and habit. Other independent variables used as covariates include: demographic variables such as site, age, years lived in the U.S., gender, country of birth, religion, education, marital status, and the Balanced Inventory of Desirable Responding (BIDR) measure of social desirability response bias. Apart from quantifying the relationship between dependent and independent variables, the study sought to test if attitude and self-efficacy mediate the relationship between acculturation and behavioral intention and also tested the plausibility of the hypothesized IBM in the sample data.

Measures

Defining the Behavior: In behavioral research, the behavior of interest must be clearly defined in terms of its target, action, context, and time before a research work is undertaken because changing any of these elements may change the behavior under study (Fishbein, 2000). The current study was focused on condom use in steady heterosexual relationships. Steady heterosexual relationship is defined as relationship that is regular (married, unmarried, or cohabiting) excluding casual sexual encounters. The behavior of interest was, therefore, condom use in steady heterosexual relationships. The *action* is the use of condoms, the *target* is the *condom*, the *context* is a steady relationship, and the *time* is consistency to using condoms or always using condoms.

IBM questionnaire: The questionnaire was specifically developed for this study from information obtained in Phase I and consisted of measures on attitude, norms, perceived behavioral control, self-efficacy, behavioral intention, and self-reported condom use (behavior)

(see Appendix B). The constructs were measured by direct and indirect methods (Ajzen, 1991; Fishbein & Ajzen, 1975; Francis et al., 2004). For example, large correlation of .5 between direct and indirect measurements may indicate that most behavioral, normative, and control beliefs underlying a behavior had been captured (Von Haeften, Fishbein, & Kasprzyk, 2001; Von Haeften & Kensi, 2001). However, smaller correlations between direct and indirect measurements may suggest that the elicitation procedure did not sufficiently glean the beliefs, or it may indicate that measured constructs were different (Von Haeften, Fishbein, & Kasprzyk, 2001). Also, contained in the questionnaire were demographic variables such as site, age, length of years lived in the U.S., gender, country of birth, religion, education, and marital status. The instrument consisted of 77-items with good internal consistency ($\alpha=.91$). Participants scored their responses on a five-point Likert-scale from (1) strongly disagree to (5) strongly agree. For this study, average scores were used in the analyses.

Intention: Behavioral intention was measured by three items: ‘if I have sex with my partner, I intend to use a condom each time’, ‘if I have sex with my partner, I plan to use a condom each time’, and ‘if I have sex with my partner, I want to use a condom each time. The subscale had very good internal consistency ($\alpha=.95$). Higher scores indicate stronger intention to use a condom.

Attitude: Attitude was measured by direct and indirect methods. Initially, attitude was measured directly by a six-item, five-point semantic differential scale: ‘if I have sex, using a condom each time would be: harmful/beneficial, good/bad, pleasant/unpleasant, agreeable/disagreeable, useless/useful, and safe/unsafe. However, the scale had a very low reliability ($\alpha=.48$). Three items were used to assess affective attitude and the other three items were designed to assess instrumental attitude. In order to improve the reliability of the scale,

option in SPSS, scale if item deleted, was used. When three items were deleted, the reliability increased to $\alpha=.69$ and scores on these items: good/bad, pleasant/unpleasant, and agreeable/disagreeable were used to measure attitude directly. Average score for these items were obtained after negatively worded items were reversely coded. Scores ranged between one and five. Higher scores indicate stronger attitude.

For indirect measurement of attitude, two constructs were measured: affective attitude and instrumental attitude. Affective attitude was measured by eight behavioral beliefs and eight outcome evaluations. Responses to the behavioral beliefs were captured by a five-point Likert-scale from (1) strongly disagree to (5) strongly agree. The responses to the outcome evaluations were also captured by a five-point Likert-scale, but were recoded into scores ranging from -2 to +2. The overall average score for affective attitude was calculated by multiplying each behavioral belief with its corresponding outcome evaluation and by taking the average. After negatively worded items were reversely coded, average scores for affective attitude ranged between -10 and +10. Negative scores indicate negative affective attitude and positive scores indicate positive affective attitude. The subscale had adequate internal consistency ($\alpha=.86$). For measuring instrumental attitude, a similar procedure was used to obtain overall scores. Negative scores indicate negative attitude while positive scores suggest positive attitude. The subscale had adequate reliability ($\alpha=.76$).

Social Norms: Social influences were measured by two constructs: injunctive and descriptive norms, measured through direct and indirect methods. Items assessing social norms asked participants what individuals or groups would support or against using condoms. For the direct measurements, responses were captured by a five-point Likert-scale from (1) strongly disagree to (5) strongly agree and the scores were averaged. The scores ranged between one and

five. Higher scores indicated higher social influence. Internal consistencies for injunctive and descriptive norms measured directly were $\alpha=.89$ and $\alpha=.91$, respectively. For the indirect measurement of injunctive and descriptive norms, normative beliefs and the motivation to comply were measured. Overall average scores were obtained by multiplying scores on injunctive normative beliefs by scores on motivation to comply and by taking the average that ranged between -10 and +10. Positive scores indicate positive social influence, and negative scores showed negative social influence. For descriptive norms, a similar procedure was followed. Both scales had adequate internal consistencies, $\alpha=.88$ and $\alpha=.75$, for injunctive and descriptive norms, respectively.

Perceived Behavioral Control: This construct was measured by direct and indirect methods as well. Items that assessed perceived behavior control asked participants what makes it easy or hard to use condoms. Responses were captured by a five-point Likert-scale from (1) strongly disagree to (5) strongly agree and scores were summed and averaged to obtain an overall score of perceived behavioral control. Scores ranged between one and five. High scores indicated greater difficulty over control of using condoms. In measuring perceived behavioral control indirectly, both the control beliefs and the perceived power of control were captured by five items. The overall scores for perceived behavioral control were obtained by multiplying scores on control beliefs by scores on perceived power of control and by taking the average. Scores ranged between -10 and +10. Positive scores indicated participants were not in control and face difficulties while negative scores suggest that participants were in control and encountered less difficulty in using condoms. Measurements of perceived behavioral control showed good reliabilities, $\alpha=.80$ and $\alpha=.88$, for direct and indirect measurements, respectively.

Self-efficacy: The construct was initially measured by five items, but when factor analysis with varimax rotation was conducted, two-items cross-loaded on intention and therefore was removed. Three items were eventually used to construct the scores on self-efficacy. Questions on self-efficacy assessed what would help participants overcome barriers to use condoms and enable them to use condoms. Responses to these questions were scored on a five-point Likert-scale from (1) strongly disagree to (5) strongly agree. Scores were summed and averaged to obtain an overall score which ranged between one and five. High scores indicated high self-efficacy. The items had good internal consistency ($\alpha=.83$).

Behavior: Self-reported condom use was measured by a single-item: ‘in the past 12 months I used a condom each time I had sex with my partner.’ The response to this question was scored on a five-point Likert-scale from (1) strongly disagree to (5) strongly agree. Scores ranged between one and five. High scores indicated high level of condom use.

Acculturation: The level of acculturation was measured by adapted 12-item Short Acculturation Scale for Hispanics (SASH) (Marin, Sabogal, VanOss-Marin, Otero-Sabogal, & Perez-Stable, 1987). Since this scale was not developed for the study population, measurement equivalency of the scale in men and women were tested by conducting multiple group confirmatory factor analyses. Results of goodness-of-fit for the configural model were $\chi^2_{(95)}=168.69$, CFI=.93, TLI=.91 and RMSEA=.09 while the goodness-of-fit for the model where factors were set to equality across groups, except for Item 1 of the acculturation scale were: $\chi^2_{(103)}=181.64$, CFI=.93, TLI=.91, RMSEA=.09. Factors loadings were not significantly different across groups: $\Delta\chi^2_{(8)}=12.96$, $p > .05$. The test showed only Item 1, ‘what language (s) do you read and speak,’ was noninvariant across men and women in the study population. In general, the scale assesses acculturation through language preference and usage as well as peer relations and

media use (Barona & Miller, 1994). The instrument was adapted to the study population's language, media, and social relation preferences. SASH has good reliability ($\alpha=.92$) and concurrent validity, $r=.7$ (Marin et al., 1987). More recently, Ellison, Jandorf, and Duhamel (2011) reported an internal consistency of ($\alpha=.89$) similar to reliability ($\alpha=.83$) found in this study. To obtain an overall level of acculturation, scores were summed and averaged. Scores ranged between one and five. High scores indicated high level of acculturation.

Habit: Condom use habit was measured by a 12-item Self-Reported Habit Index (SRHI). SRHI measures the recurrence and automaticity of a behavior and the degree to which it is related to one's self-identity (Verplanken & Orbell, 2003). The instrument has been reported to have high test-retest reliability $r=.91$ (Verplanken & Orbell, 2003), and high internal consistency, $\alpha=.94$, $\alpha=.89$ (Norman, 2011; Verplanken & Orbell, 2003) which is also in agreement with the internal consistency reliability found in this study ($\alpha=.88$). Moreover, SRHI was found to have good concurrent validity with behavioral frequency measures, $r=.74$ (Verplanken & Orbell, 2003). In measuring habit, participants responded to the phrase "using condoms with my steady partner is something... followed by 12-items such as, 'I do frequently', I do without having to consciously remember.' Responses to these questions were scored on a five-point Likert scale from (1) strongly agree to (5) strongly disagree. Negatively worded items were reverse coded and averaged. Scores ranges between one and five. High scores showed strong habit.

Social desirability: The Balanced Inventory of Desirable Responding, BIDR (Paulhus, 1988) is a 40-item scale, however, item 13, 'the reason I vote is because my vote can make a difference' was excluded because it was not relevant to the study population. The BIDR consists of two subscales: Self-Deception Enhancement (SDE) and Impression Management (IM). SDE refers to an unintentional tendency to present oneself favorably because the person truly beliefs it

while IM reflects the propensity to deliberately misrepresent oneself in order to be perceived favorably by others (Li & Bagger, 2007). The instrument has been reported to have good validity and reliability. After summarizing reports from 236 articles and 30 dissertations, Li and Bagger (2007) reported mean internal consistency coefficients ($\alpha = .74, .68, .80$) for SDE, IM, and BIDR respectively, on par with internal consistency ($\alpha = .76$) obtained for BIDR in this study. The instrument also showed good convergent and discriminant validities (Paulhus, 1988). Participants' responses were captured on a seven-point scale from (1) not true to (7) very true. Negatively worded were reverse coded. To obtain an overall measure of social desirability, all 39 items were summed according to the procedure (Paulhus, 1988) and averaged. BIDR was included in the analyses to correct for biases that may arise from participants providing favorable responses.

Procedure

Study participants were actively solicited at public venues such as mosques, local cafes, and restaurants and those who met the inclusion criteria and gave verbal consent were provided with a written briefing, describing participants' rights, assurance of confidentiality, and the risks and benefits of participating in the study. The questionnaires were available in two languages: English and Amharic (Ethiopian) from which participants could select. The translated instrument was back translated by a professional translator to ensure equivalency. Eventually, the questionnaires were administered individually to each participant in a private setting at a time and place of participants' preference. The time to complete the questionnaire was about 60 minutes. The study was conducted August-October, 2012, and as in Phase I, no monetary incentives were provided. However, participants were thanked for their participation.

Approach to Analyses

Data Cleaning & Screening: Data were input in SPSS 19.0 database after subject IDs were assigned to the questionnaires. Input values were verified and checked for conformity to the rules set for the data. Data cleaning is “a process of detecting, diagnosing, and editing faulty data” (Van den Broeck, Cunningham, Eeckels, & Herbst, 2005, p.267). A frequency distribution was generated for each variable. When discrepancies were found, incorrect values were replaced with valid values from the questionnaires. Furthermore, range, means, and standard deviations of all variables were examined to determine the plausibility of the data.

Univariate and multivariate outliers were examined as described in Tabachnick & Fidell (2007). When participants have one extreme score on one variable, the score is called a univariate outlier. Cases with standardized z-scores above 3.29 are potential univariate outliers (Tabachnick & Fidell, 2007). Three participants were identified to have univariate outliers, two of whom lived in the U.S. for 30 years. The third participant had an outlier value on social desirability index. To examine multivariate outliers, Mahalanobis distance was evaluated. Two participants were identified to be multivariate outliers one of whom was also a univariate outlier. Eventually, data on four participants were excluded from the sample size of 205 leaving 201 subjects for the final analyses.

The problem of multicollinearity is encountered when measured variables are highly correlated, $r = .9$ or above (Tabachnick and Fidell, 2007). Variables were not highly correlated with each other as evidenced by the correlation matrix (see Table 6). Moreover, all tolerance values were greater than 0.1 and all variance inflation factors were below 10.

The data were also examined for normality, linearity, and homoscedasticity. Regression and structural equation modeling assume the data to be normally distributed (Weston et al.,

2008). Screening for univariate normality can be informative if multivariate normality exists (Weston, et al., 2008). Data were examined for skewness and kurtosis. Values for skewness were between -1 and +1 while all variables in the data had kurtosis values between -2 to +2, therefore no evidence of skewness and kurtosis were found. Furthermore, normality, linearity, and homoscedasticity were examined by plotting the regression standardized residual against regression standardized predicted values. When the residual scatterplot was examined, the cluster of points were approximately the same width and were concentrated in the middle with a rectangular shape suggesting that the data met the assumptions of normality, linearity, and homoscedasticity.

Common Method Bias: In cross-sectional studies where self-reported data are collected through the same questionnaire during the same period of time, common method bias can occur (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Common method bias refers to the error that arises from using the same method (questionnaire) to collect data for a study (Podsakoff et al., 2003; Craighead, Ketchen, Dunn, & Hult, 2011). This may increase the systematic errors that may bias results by inflating or deflating estimates of the true association between constructs of interest, leading to Type I and Type II errors (Podsakoff et al., 2003; Craighead, et al., 2011). The most widely used method for testing common method bias is Harman's single-factor test (Podsakoff et al., 2003). To test the presence of common method bias, Harman's single-factor test was run. All variables in the study were loaded into exploratory factor analysis. To estimate factors, maximum likelihood procedure was used and unrotated factor solutions examined. The assumption of the test is that if significant common method bias is present, one of two things could happen; either (1) only a single factor is obtained from the factor analysis, or (2) the majority of covariance is attributed to a single factor (Podsakoff et al., 2003). Neither a single

factor nor the majority of covariance was attributed to a single factor. The first factor, the largest, accounted only for 12.8% of the variance extracted. Thus, no evidence of substantial common method bias was found.

Social desirability, the tendency of individuals to provide responses that is viewed favorably by others (Adams, 2005; Ganster, Hennessey, & Luthans, 1983; Hebert et al., 1997; Podsakoff et al., 2003) can also introduce systematic errors that bias results and produce spurious correlations, mask effects, and condition relationships between variables (Ganster, Hennessey, & Luthans, 1983). In order to minimize the influence of social desirability on parameter estimates, scores on the Balanced Inventory of Desirable Responding, BIDR (Paulhus, 1988) scale were entered in the regression and correlation analyses.

Missing Data: Large missing data can reduce statistical power and introduce bias in parameter estimates (Acock, 2005; Myers, 2011; Tabachnick & Fidell, 2007). According to Tabachnick & Fidell (2007), in cases where 5% or less of missing data at random, any procedure for handling missing data can be used. In our data set, since the majority of variables had more than 5% of their values missing, we used multiple imputation (MI) technique to estimate the missing values. The computer software, NORM (Schafer, 1999), was used to generate multiple imputations for the incomplete data. NORM assumes normal distribution of variables in the data. We also assume that the data were missing at random. When data are missing at random, it is assumed that the probability of missing data are not associated to the score of the participants in the missing variable, but instead are dependent on observed values measured in the data (Acock, 2005; Mulla, Seo, Kalanegham, & Nuwahid, 2009; Myers, 2011). In MI procedure, NORM (Schafer, 1999), uses the observed data and simulates the missing data $m > 1$ times to generate m equivalent complete data sets.

NORM imputes data sets by two consecutive procedures: expectation-maximization (EM) algorithm and data augmentation techniques (Schafer, 1999). EM algorithm is an iterative procedure for finding maximum likelihood estimates for the incomplete data (Mulla et al., 2009). Data augmentation is also an iterative procedure that uses special Markov chain Monte Carlo (MCMC) method to generate multiple imputations by simulating new values from Bayesian posterior distribution (Schafer, 1999).

The number of imputations performed using this method was five, a default number, in most multiple imputation computer programs. Because in EM convergence was achieved at 300, iteration between imputations was set at 300. Therefore, the five data sets were generated at 300, 600, 900, 1200, and 1500 iterations. Each data set was analyzed separately and results combined with Rubin's rule of scalar estimands (Rubin, 1987). However, Rubin's scalar estimands procedure, neither allows the combining of R-squares and R-square changes, nor does it provide a way to test the statistical significance of R-square changes (F-changes). Thus, results for R-square and R-square changes were averaged for the five data sets. For the structural equation modeling, a model for missing values, Mplus 7.0 was used. The program does not impute values for the missing data. Instead, it uses all available data to estimate parameters in the model by using full information maximum likelihood, but without directly filling the missing data (Muthen & Muthen, 1998-2012).

Data Analyses

Descriptive Statistics: Descriptive statistics (e.g., percentages, means, and standard deviations) were calculated to describe the characteristics of the study population and to provide point estimates for the main study variables. Correlations were computed to show predictive relationships between different variables. When multiple comparisons are made in a single data,

there is increased risk of type I error. The risk can be reduced with Bonferroni correction.

Testing each hypothesis at a statistical significance level of α/n (n = number of tests) is recommended. A p-value of 0.0005 was used to assess the significance level of the intercorrelations in this study.

Hierarchical Linear Regression: Hierarchical regression was used to assess the relationship between the dependent variables, behavioral intention to use condoms and self-reported condom use, and the main independent variables, affective attitude, instrumental attitude, injunctive norms, descriptive norms, perceived behavioral control, self-efficacy, acculturation, and habit. Variables such as site, age, years lived in the U.S., gender, country of birth, religion, education, marital status, and BIDR were used as covariates. Indirect measurements of affective attitude, instrumental attitude, injunctive norms, descriptive norms, and perceived behavioral control were used in the regression models.

Before testing the independent contribution of each variable, in a multivariate model, categorical variables were dummy coded. Variables, site (outside metro=0, metro=1), gender (women=0, men=1), country of birth (Somalia=0, Ethiopia=1), religion (Muslim=0, Christian=1, other beliefs=1), marital status (married=0, unmarried=1, divorced, separated, or widowed=1) were each coded. The remaining variables were entered as continuous variables. In the analyses, predictor variables were entered in four models in hierarchical steps. In Model 1, all the demographic variables plus BIDR were entered. In Model 2, constructs of Theory Planned Behavior (affective attitude, instrumental attitude, injunctive norms, descriptive norms, and perceived behavioral control) were entered. In Model 3, self-efficacy from the Social Cognitive Theory was entered, and in Model 4, acculturation and habit were entered. Parameter estimate for each variable along with R-square and R-square changes were obtained for each analysis.

Mediational Analysis: Mediational analysis also called intervening variable model (Hayes, 2009), is when an independent variable is hypothesized to exert its influence on the outcome variable through another variable called mediators (Hayes, 2009). In this study, a simple mediation model (Figure 4) was used to examine if the association between acculturation and behavioral intention to use condoms was mediated by attitude or self-efficacy.

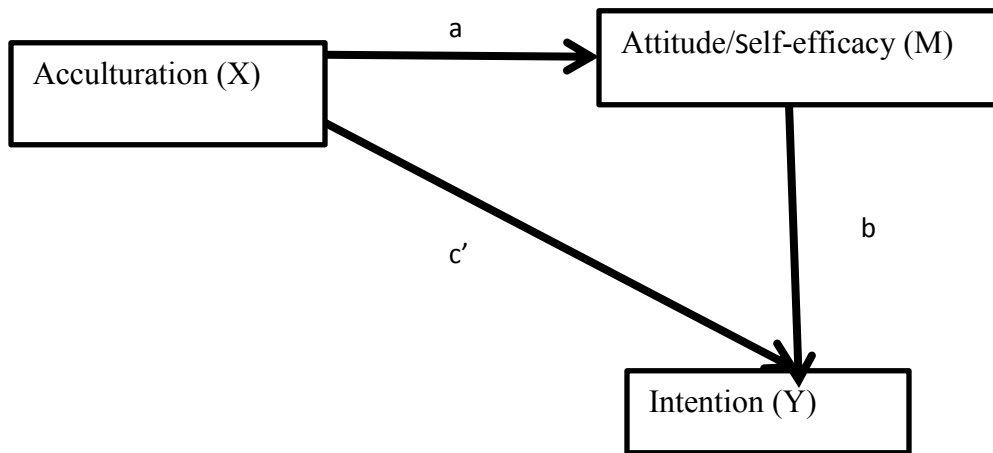


Figure 4: Simple Mediation Model

In the model, a is the coefficient for predicting attitude or self-efficacy (M) from acculturation (X), b is coefficient of predicting behavioral intention (Y) from M, and c' represents, the coefficient for predicting behavioral intention from acculturation (X) while adjusting for M. In other words, c' represents the direct effect of acculturation on intention when M is in the model, while the product of a and b represents the indirect effect of acculturation on intention. The total effect was calculated by adding the direct effect (c') and the product of a and b (Hayes, 2009).

The model was analyzed by SPSS PROCESS (Hayes, 2012). Demographic variables: site, age, gender, education, marital status, and religion were included as covariates. The model was run five times, once for each imputed data set and results were combined with Rubin's rule of scalar estimands (Rubin, 1987). In determining the statistical significance of indirect effects, however, a procedure called bootstrapping was used (Hayes, 2009). The Sobel test of significance of indirect effects assumes the distribution of indirect effects to be normal. However, indirect effects tend to have skewed distribution (Bollen & Stine, 1990). Hence, bootstrapping is a preferred way to estimate standard errors and confidence intervals for indirect effects (Hayes, 2009). "Bootstrapping generates an empirical representation of the sampling distribution of the indirect effect by treating the obtained sample of size n a representation of the population miniature, one that is repeatedly resampled during analysis as means of mimicking the original sampling process" (Hayes, 2009, p. 412). The process is usually repeated many times. In this analysis, the repetition was set at 10000.

Structural Equation Modeling (SEM): The plausibility of hypothesized relationships among constructs is tested by structural equation models (SEM) (Raykov & Marcoulides, 2006). Unlike the traditional regression models structural equation models account for measurement errors in observed variables (Raykov & Marcoulides, 2006). Hypothesis testing in SEM examines the fit of the proposed model to the observed sample. Before the full structural model is tested where the relationships among latent variables are examined, it is common to estimate the measurement model. The primary concern when working with full SEM is to assess the extent to which the relationships between latent variables in the model are valid (Byrne, 2011). Thus, confirmatory factor analysis is the first step in SEM to test if indicator variables load as specified in the hypothesized model. In other words, if the measurement model has a good fit, it

makes possible to exclude the measurement model as a source of poor fit when the full structural model is estimated (Weston et al., 2008). Therefore, in this study, two confirmatory factor analyses were run for two models: the hypothesized model (Model 1) and the re-specified model (Model 2) before the full structural model were estimated. For this study, model for missing values, Mplus 7.0, was used and parameters estimated by maximum likelihood procedure.

In evaluating model fit in SEM, various fit indices are commonly reported. The first is a Chi-Square test which measures the discrepancy between the sample data and the restricted model (Byrne, 2011; Hu and Bentler, 1999). Non-significant Chi-square test is what desired for well-fitting models (Iacobucci, 2010). However, Chi-square tests are sensitive to sample size and become significant as degrees of freedom increase, often rejecting models with large sample size; lack power when sample size is small and reject models as misspecified when samples are not normally distributed (Byrne, 2011; Iacobucci, 2010). Therefore, model fit in SEM are assessed by fit indices such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and Standardized Root-Mean-Square-Residual (SRMR). CFI measures the percentage of improvement of model fit as compared to null or baseline model (Byrne, 2011). A CFI value $\geq .95$ indicates a good fitting model (Hu & Bentler, 1999). TLI or Non-normed Fit Index (NNFI) is similar to CFI; however, values can go over the range 0-1.0 (Byrne, 2011; Hooper, Coughlan, & Mullen, 2008). This index adds penalty for complexity of the model and values close to 1.0 are considered good fit (Byrne, 2011; Hooper, Coughlan, & Mullen, 2008). RMSEA and SRMR measure the discrepancy or the residuals between the data and the predicted model (Byrne, 2011; Iacobucci, 2010). $RMSEA \leq .05$ indicates close fit; between .05 and .08 indicate reasonable fit; $RMSEA \geq .10$ indicate bad fit

(Browne & Cudeck, 1993). Cut off for good fit is $\leq .08$ for SRMR as recommended by Hu and Bentler (1999).

Confirmatory Factor Analyses: The measurement model for the hypothesized model (model 1) had 33 indicator variables. Attitude toward using a condom was measured by three items ($\alpha=.69$), norms were measured by six items ($\alpha=.93$), perceived behavioral control was measured by six items ($\alpha=.80$), self-efficacy was measured by three items ($\alpha=.83$), intention was measured by three items ($\alpha=.95$) and habit was measured by 12 items ($\alpha=.95$). For the hypothesized model (see Figure 5). Asterisks in the Figure represent standardized factor loadings or path coefficients to be estimated.

Initially, the measurement part of the hypothesized model was run in a confirmatory factor analysis and modification indices examined. Based on the information from modification indices and factor loadings, error terms for some items were correlated to improve the fit of the model. For example, Items 1 and 2 under self-efficacy, items 2 and 3, items 5 and 6, under norms, and items 2 and 3, items 11 and 12, under habit were correlated. Moreover, two items on perceived behavioral control with a loading of .35 and .27 were removed and then the model was re-run.

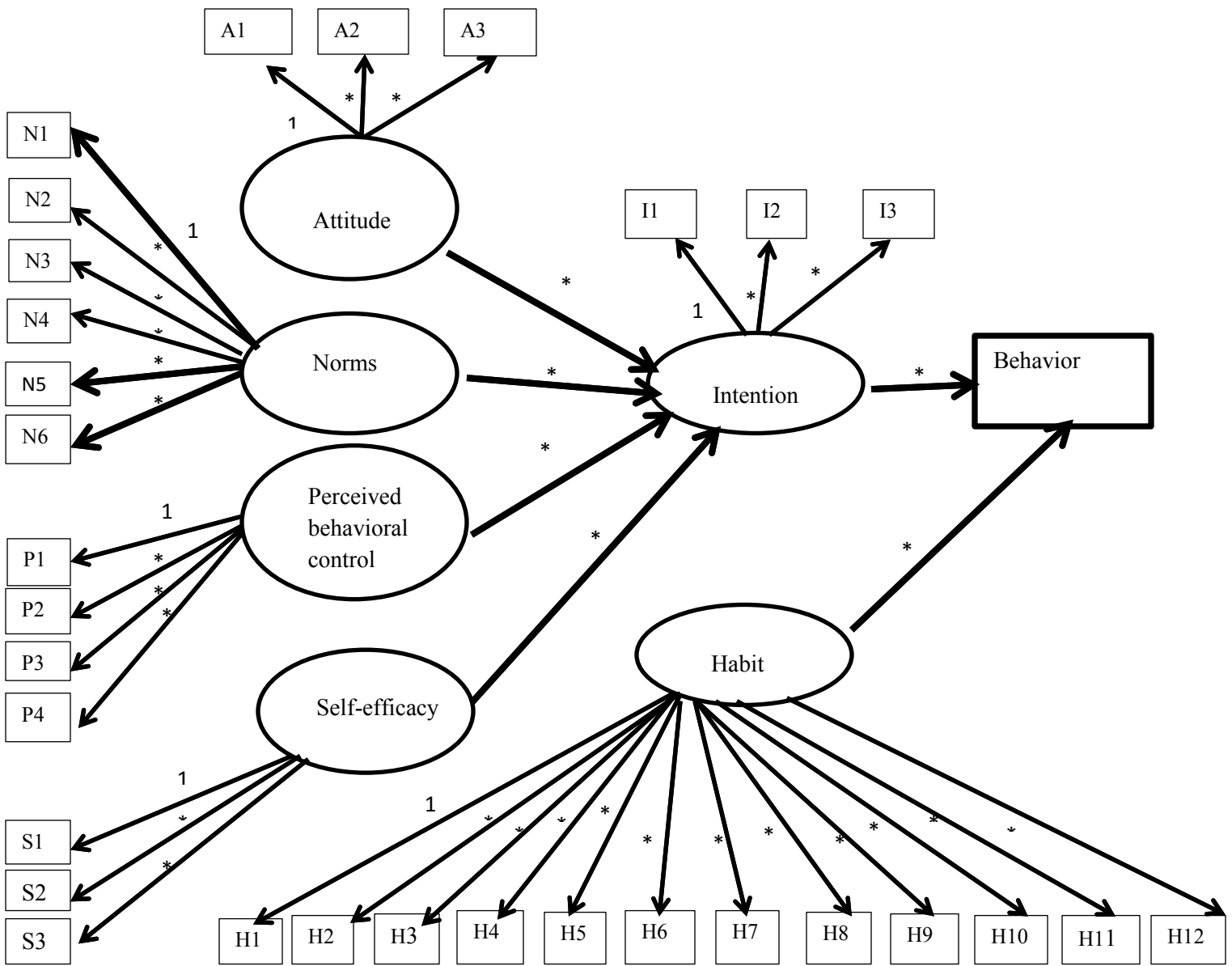


Figure 5: Hypothesized Model (Model 1)

Attitude measured was by three items (A1-A3), norms were measured by six items (N1-N6), perceived behavioral control was measured by four items (P1-P4), self-efficacy was measured by three items (S1-S3), habit was measured by 12-items (H1-H12), intention was measured by three items (I1-I3), and behavior was measured by a single item. *Estimated factor loadings or path coefficients.

The measurement part of the hypothesized model had fit indices: χ^2 (414, N=201) = 827.41 $p < .0001$, CFI = .89, TLI = .88; RMSEA = .07 (90% confidence interval: .063, .08), SRMR = .07, interpreted as not very good fit. The reason could be that the average variance extracted (AVE) by items on the latent variable (habit) was only .39. AVE of 0.5 or above is what required for adequate convergent validity which means that the latent variable was not adequately explained by the observed variables (Hair, Black, Babin, & Anderson, 2010; Ping, 2005). As the result, the 12 indicators for measuring habit were removed from the model and confirmatory factor analysis for the re-specified model (Model 2) was run with 20 indicator variables. Attitude was measured by three items, norms by six items, perceived behavioral control by 4 items, self-efficacy by three items, and intention by three items. See Figure 6 for the re-specified model (model 2). Since, the result of the confirmatory factor analysis for model 2 showed improvement in model fit: χ^2 (139, N=201) = 264.25 $p < .0001$, CFI = .95, TLI = .94; RMSEA = .067 (90% confidence interval: .055, .078), SRMR = .055, in the next step, the associations among latent variables were estimated in a full structural model in model 2 (see figure 6). In summary, this study was conducted in two phases—the elicitation phase (Phase I) and the cross-sectional survey phase (Phase II). In Phase I, behavioral, normative, and control beliefs specific to the East-African population were identified. Based on these key behavioral, normative, and control beliefs, a survey instrument was designed on constructs of Integrated Behavioral Model (IBM) (IOM, 2002). This instrument along with the Balanced Inventory of Desirable Responding, BIDR (Paulhus, 1988), the Self-Reported Habit Index (SRHI) (Verplanken & Orbell, 2003), and the adapted Short Acculturation Scale for Hispanics (SASH) (Marin et al., 1987) were administered to a cross-sectional sample of 205 East-African immigrants (Somali and Ethiopian) men and women, 18 years or older who were living in Minnesota. By using a multivariate

statistics, key psychosocial determinants of condom use with steady partner in a heterosexual relationship, as pertained to condom use in East-African population in Minnesota were identified.

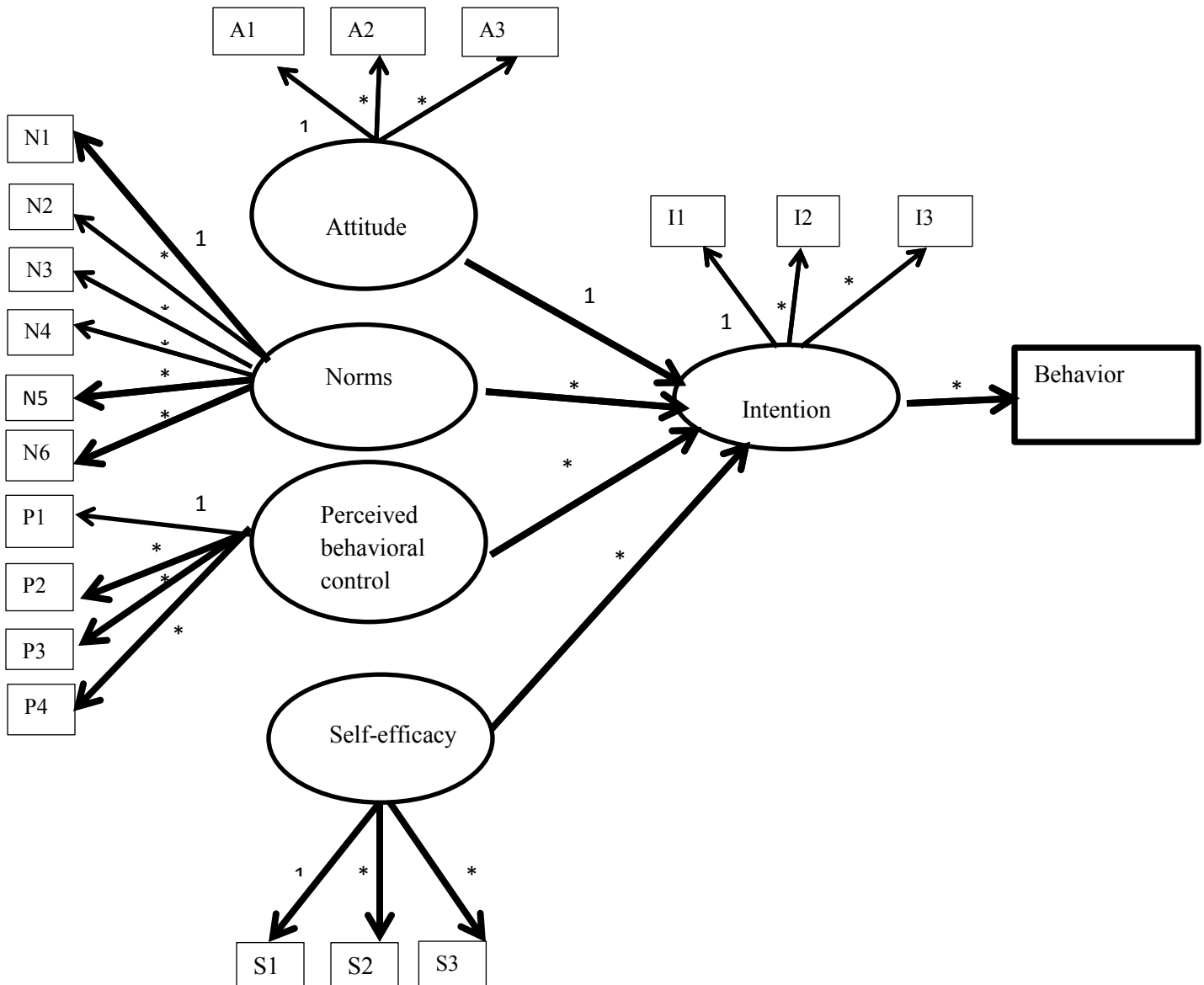


Figure 6: Re-specified Model (Model 2)

Attitude measured was by three items (A1-A3), norms were measured by six items (N1-N6), perceived behavioral control was measured by four items (P1-P4), self-efficacy was measured by three items (S1-S3), intention was measured by three items (I1-I3) and behavior was measured by a single item. *Estimated factor loadings or path coefficients.

CHAPTER 4: RESULTS

Overview

The hypotheses were to test the association between the main independent variables (attitude, norms, perceived behavioral control, self-efficacy, acculturation, and habit) and the dependent variables (the intention to use condoms and self-reported condom use) in steady heterosexual relationships among East-African immigrants. Moreover, attitude and self-efficacy were hypothesized to mediate the association between acculturation and intention. Finally, the hypothesized Integrated Behavioral Model (IBM) was tested to determine if it adequately fit the sample data.

Sample Characteristics

A summary of the participants characteristics are illustrated in Table 4. The sample consisted of 201 East-African immigrants of whom 55.2% were men, and 44.8% women. The majority of the participants (76.1%) were immigrants from Ethiopia, the rest were Somali immigrants. The majority (66.7%) of the study participants were recruited from Minneapolis-St. Paul metropolitan area. Overall, the average age of the participants was 30.2 years ($SD=8.7$) and the range was 18-67 years. Study participants have lived in the U.S., for almost eight years ($SD=5.1$) on average; Almost 58% were Christians, 38% Muslims, and 5% had other religious affiliations. Of the study participants, 40.3% had some college education, 19.4% graduated from high school, 17.9% had some high school education, 16.9% graduated from college, 3.5% had elementary education, and 2% never attended school. The majority (64.2%) of the participants were unmarried.

Table 4

Self-reported demographic characteristics of study participants

Demographic Characteristics	Sites					
	Metro N=134		Outside Metro N=67		Overall N= 201	
	N	%	N	%	N	%
Age ‡	32.4 (7.5)		25.7 (8.5)		30.2 (8.7)	
Years lived in the U.S. ‡	6.2 (5.0)		10.1 (4.8)		7.5 (5.1)	
Gender						
Men	65	48.5	46	68.7	111	55.2
Women	69	51.5	21	31.3	90	44.8
Country of Birth						
Ethiopia	132	98.5	21	31.3	153	76.1
Somalia	2	1.5	46	68.7	48	23.9
Religious affiliation						
Christians	106	79.1	8	11.9	114	56.7
Muslims	20	14.9	57	85.1	77	38.3
Others†	8	6.0	2	3.0	10	5.0
Education						
Never attended school	4	3.0	0	0	4	2.0
Elementary school	7	5.2	0	0	7	3.5
Some high school	31	23.1	5	7.5	36	17.9
High school graduate	34	25.4	5	7.5	39	19.4
Some college	35	26.1	46	68.7	81	40.3
College graduate	23	17.2	11	16.4	34	16.9
Marital status						
Married	44	32.8	13	19.4	57	28.4
Unmarried	79	59.0	50	74.6	129	64.2
Divorced/separated/widowed	11	8.2	4	6.0	15	7.5

‡Mean (SD); † not specified

Percentages may not add to 100 due to rounding.

Univariate & Bivariate Analyses

The pooled means and standard deviations of the main variables are illustrated in Table 5. Overall, participants were low intenders and users of condom; exhibited less favorable attitude toward condom use, and experienced slight positive social influence as measured by injunctive and descriptive norms. Participants had higher perceived behavioral control (higher scores reflect lower perceived behavior control), thus reported little difficulties in using condoms. On average, participants lacked strong self-efficacy and habits of using condoms. Similarly, participants had low level of acculturation and had low scores on Balanced Inventory of Desirable Responding (BIDR) scale, a measure of social desirability response bias.

Table 5

Pooled descriptive statistics

Variables	Cronbach's Alpha	Mean	SD	Range	Scale
Intention	.95	3.22	1.16	1-5	1-5
Behavior	-	3.22	1.23	1-5	1-5
Attitude ¹	.69	3.16	1.20	1-5	1-5
Affective attitude ²	.86	1.99	2.6	-2.75-10	-10-10
Instrumental attitude ²	.76	2.15	3.43	-6.50-10	-10-10
Injunctive norms ¹	.89	3.33	1.21	1-5	1-5
Injunctive norms ²	.88	1.11	3.23	-6.40-10	-10-10
Descriptive norms ¹	.91	3.45	1.14	1-5	1-5
Descriptive norms ²	.75	.27	2.51	-5.60-10	-10-10
Perceived behavioral control ¹	.80	2.56	.91	1-5	1-5
Perceived behavioral control ²	.88	-.34	2.15	-5.30-7.60	-10-10
Self-efficacy	.83	3.40	1.04	1-5	1-5
Acculturation	.83	2.56	.69	1.17-4.45	1-5
Habit	.88	3.16	.75	1.30-5	1-5
BIDR	.76	4.19	.52	2.70-4.80	1-7

BIDR= Balanced Inventory of Desirable Responding; SD=standard deviation.

¹direct measurements; ² indirect measurements.

Intercorrelations: Pooled intercorrelations among the main variables in the study are presented in Table 6. Most variables correlated significantly with behavioral intention. Self-efficacy ($r=.59, p <.0005$) and condom use ($r=.57, p <.0005$) were highly correlated with behavioral intention. The relationships between social norms and intention to use condoms were medium to large and significant. Attitude (measured directly) and behavioral intention were correlated, but not significantly ($r=.20, p >.0005$); however, behavioral intention significantly associated with instrumental attitude ($r=.43, p <.0005$) and affective attitude ($r=.29, p <.0005$). Intercorrelations between perceived behavioral control, acculturation, habit, BIDR, and behavioral intention were small and not significant. The non-significant association between BIDR and behavioral intention may reflect little bias arising from participants providing socially desirable responses in this study.

Similarly, for condom use, social norms, self-efficacy, instrumental attitude showed medium to large correlations while perceived behavioral control was not significantly associated, as did acculturation, habit, and BIDR. As expected, the association between attitude (measured directly) and affective attitude (measured indirectly) was medium to large and significant ($r=.43, p <.0005$). Concurring with the expectation, direct and indirect measurements of injunctive norms were highly correlated ($r=.56, p <.0005$) while direct and indirect measurements of descriptive norms had medium to large correlation ($r=.48, p <.0005$) as did the direct and indirect measurements of perceived behavioral control ($r=.41, p <.0005$).

Table 6

Pooled intercorrelations between main variables in the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Intention	-														
2.Behavior	.57***	-													
3.Attitude ¹	.20	.17	-												
4.Affective attitude ²	.29***	.21	.43***	-											
5. Instrumental attitude ²	.43***	.32***	.19	.35***	-										
6.Injunctive norm ¹	.44***	.35***	.13	.28***	.47***	-									
7. Injunctive norm ²	.48***	.50***	.10	.21	.48***	.56***	-								
8. Descriptive norm ¹	.35***	.30***	.13	.17	.36***	.79***	.65***	-							
9. Descriptive norm ²	.47***	.42***	.19	.16	.33***	.49***	.53***	.48***	-						
10. Perceived behavioral control ¹	-.14	-.11	-.29**	-.39***	-.29***	-.05	-.05	-.07	.00	-					
11. Perceived behavioral control ²	.11	-.07	-.25***	-.34***	-.07	.16	.11	.23	.17	.41***	-				
12. Self-efficacy	.59***	.30***	.20	.27***	.38***	.41***	.43***	.43***	.40***	.00	.25***	-			
13. Acculturation	.21	.19	.19	.12	.12	.07	.22	.08	.20	-.08	-.05	.22	-		
14. Habit	.18	-.18	.02	.05	.03	.03	.28***	.04	.21	-.01	-.14	.12	.18	-	
15. BIDR	.12	.12	.16	.24	.21	.05	.16	.04	.08	-.19	-.12	.17	.21	.02	-

***p<.0005; BIDR= Balanced Inventory of Desirable Responding

Hierarchical Linear Regressions: The regression analyses for behavioral intention regressed intention on several sets of independent variables. The effect of demographic variables and social desirability response bias were accounted for in Model 1. Model 2 added constructs of Theory of Planned Behavior (TPB). Model 3 added self-efficacy from Social Cognitive Theory. Finally, Model 4 examined the effect of acculturation and habit. A similar approach was followed for regression analyses of self-reported condom use.

Intention: When demographic variables and social desirability bias were controlled in Model 1, age ($\beta = -.21, p < .01$) and years lived in the U.S. ($\beta = .21, p < .05$) had the strongest, but opposite effects on behavioral intention. Younger participants had higher behavioral intention to use condoms than older participants; however, the longer participants lived in the U.S., the higher their behavioral intention to use condoms. Likewise, education exerted positive and significant influence ($\beta = .18, p < .05$); higher educational levels mean higher behavioral intention to use condoms. As a whole, Model 1 explained 12% ($R^2 = .12$) of the variance in behavioral intention to use condoms (Table 7).

Model 2 examined the contribution of TPB constructs. Although significant influence of age and education remained, constructs of TPB exerted significant and direct effects on behavioral intention. Descriptive norms ($\beta = .25, p < .05$), injunctive norms ($\beta = .18, p < .05$), instrumental attitude ($\beta = .18, p < .05$), and affective attitude ($\beta = .15, p < .05$) significantly influenced behavioral intention. Perceived behavioral control, however, had no influence on behavioral intention. As a whole, TPB explained an additional 28% ($\Delta R^2 = .28$) of the variance in behavioral intention, and Model 2 accounted for 40% ($R^2 = .40$) of the variance in intention to use condoms.

Table 7

Pooled hierarchical regression coefficients for intention to use condom

	Model 1	Model 2	Model 3	Model 4
Variables	β	β	β	β
Site				
Outside Metro (reference)				
Metro	.15	.12	.17	.17
Age	-.21**	-.15*	-.14	-.13
Years lived in the U.S.	.21*	.09	.07	.06
Gender				
Women (reference)				
Men	-.03	.01	.01	.01
Country of birth				
Somalia (reference)				
Ethiopia	.04	.02	-.02	-.01
Religion				
Muslim (reference)				
Christian	-.05	-.06	-.06	-.06
Other beliefs	-.06	-.04	-.05	-.06
Education (grade level)	.18*	.12*	.07	.07
Marital status				
Married (reference)				
Unmarried	.10	.02	.02	.02
Divorced, separated , or widowed	-.02	-.05	-.04	-.04
BIDR	.08	.00	-.01	-.01
Affective attitude		.15*	.06	.07
Instrumental attitude		.18*	.14	.14*
Injunctive norms		.18*	.12	.11
Descriptive norms		.25*	.19**	.19**
Perceived behavioral control		.11	.00	.01
Self-efficacy			.37**	.36**
Acculturation				.04
Habit				.02
R ²	12.2	40.2	48.5	48.5
ΔR^2		28	8.3	.00

*p<.05; **p<.01; BIDR= Balanced Inventory of Desirable Responding.

When self-efficacy was introduced in Model 3, it had the strongest effect ($\beta=.37, p<.01$) on behavioral intention, accounting for 8.3% ($\Delta R^2=.083$) of the variance in behavioral intention. Descriptive norms ($\beta=.19, p<.01$) and instrumental attitude ($\beta=.14, p<.05$) also exerted direct and significant influence on behavioral intention. Generally, model 3 accounted for 48.5% ($R^2=.485$) of the variance in behavioral intention. Acculturation and habit failed to explain significant levels of variance when added in Model 4. However, self-efficacy was the variable with strongest influence on intention to use condoms among East-African immigrants in the study (Table 7).

Behavior: Demographic variables and social desirability response bias were accounted for in Model 1. In the model, study site exerted the strongest influence on condom use ($\beta=.46, p<.01$) as participants from metro area reported higher level of condom use than participants from outside metro area. Similar to the result in behavioral intention, the longer participants lived in the U.S., the higher the level of condom use ($\beta=.24, p<.05$). Social desirability response bias as measured by the Balanced Inventory of Desirable Responding (BIDR) scale, exerted significant ($\beta=.15, p<.05$) and direct influence on condom use, however, the effect disappeared in subsequent analyses. Overall, Model 1 explained 13% ($R^2=.13$) of the variance in condom use (Table 8).

When constructs of TPB were entered in Model 2, the effect of site remained and was significant ($\beta=.45, p<.01$). Of the main variables, however, injunctive norms ($\beta=.27, p<.01$), descriptive norms ($\beta=.24, p<.01$), and instrumental attitude ($\beta=.15, p<.05$) had direct and significant influence, accounting for 25.5% ($\Delta R^2=.255$) of the variance in condom use. Self-efficacy did not significantly influence ($\beta=.14, p>.05$) condom use when introduced in Model 3 and contributed 1.2% ($\Delta R^2=.012$) of the variation in condom use.

Table 8

Pooled hierarchical regression coefficients for self-reported condom use

	Model 1	Model 2	Model 3	Model 4
	β	β	β	β
Variables				
Site				
Outside Metro (reference)				
Metro	.46**	.45**	.47*	.46**
Age	-.11	-.06	-.02	-.01
Years lived in the U.S.	.24**	.13	.12	.08
Gender				
Women (reference)				
Men	-.10	-.05	-.05	-.02
Country				
Somalia (reference)				
Ethiopia	-.01	-.02	-.02	-.02
Religion				
Muslim (reference)				
Christian	-.17	-.19	-.20*	-.19
Other beliefs	-.15	-.14	-.14	-.16*
Education	.07	.02	.00	.01
Marital status				
Married (reference)				
Unmarried	.10	.03	.03	.04
Divorced, separated, or widowed	.02	.01	.01	.01
BIDR	.15*	.06	.05	.04
Affective attitude		-.01	-.04	-.03
Instrumental attitude		.15*	.14	.17*
Injunctive norms		.27**	.25**	.18**
Descriptive norms		.24**	.22**	.20**
Perceived behavioral control		-.14	-.18*	-.14
Self-efficacy			.14	.12
Acculturation				.16*
Habit				.10
R ²	13.0	38.5	39.7	42.8
ΔR^2		25.5	1.2	3.1

* $p < .05$; ** $p < .01$; BIDR= Balanced Inventory of Desirable Responding.

Among the main variables in the study, injunctive norms had strongest influence ($\beta=.25$, $p < .01$) followed by descriptive norms ($\beta=.22$, $p < .01$) and perceived behavioral control ($\beta=-.18$, $p < .05$). The negative beta coefficient of perceived behavioral control suggests that the more difficulties and obstacles one encounters, the less likely one would use a condom. Among demographic variables, site and religion showed significant effects as well. Overall, Model 3 accounted for 40% of the variation in condom use (Table 8). In Model 4, acculturation exerted direct and significant ($\beta=.16$, $p < .05$) influence on condom use. However, among the main variables, descriptive norms ($\beta=.20$, $p < .01$), injunctive norms ($\beta=.18$, $p < .01$), and instrumental attitude ($\beta=.17$, $p < .51$), exerted significant influence on condom use. Among demographic variables, site and religion had significant effect. As a whole, acculturation and habit contributed 3% ($\Delta R^2=.03$) of the variability in condom use. However, Model 4 explained 43% ($R^2=.43$) of the variance in condom use (Table 8).

Mediational Analyses: Simple mediation models were tested to examine if the association between acculturation and intention was mediated by attitude or self-efficacy. The mediational roles of attitude and self-efficacy were tested separately in acculturation–intention relationship. In the models tested, a is the coefficient for predicting attitude or self-efficacy (M), from acculturation (X), b is coefficient of predicting behavioral intention (Y), from M, and c' represents the coefficient of predicting behavioral intention from acculturation (X) while adjusting for M. In other words, c' represents the direct effect of acculturation on behavioral intention when M is in the model. The statistical significance of indirect effects was determined by bootstrapping technique that provided confidence interval around the indirect effects. Demographic variables such as site, age, gender, education, marital status, and religion were included as covariates because these variables as a group contributed 9% of the variation in

behavioral intention. The length participants lived in the U.S., however, was not included as a covariate because it may share the same variance with acculturation.

Attitude: Unstandardized regression coefficients are illustrated in Figure 7. The path from acculturation to attitude was significant ($b=.26, p < .05$); however, the path from attitude to intention was not ($b=.14, p > .05$). Although there was significant direct and total effects of acculturation ($b=.27, p < .05$; $b=.31, p < .05$), respectively, the indirect effect of acculturation was not significant, $b=.04$ (95%BootCI=.00-.11). Given attitude had no significant influence on behavioral intention and boots confidence interval included zero in the interval, there was no evidence that attitude mediated the association between acculturation and behavioral intention in this study.

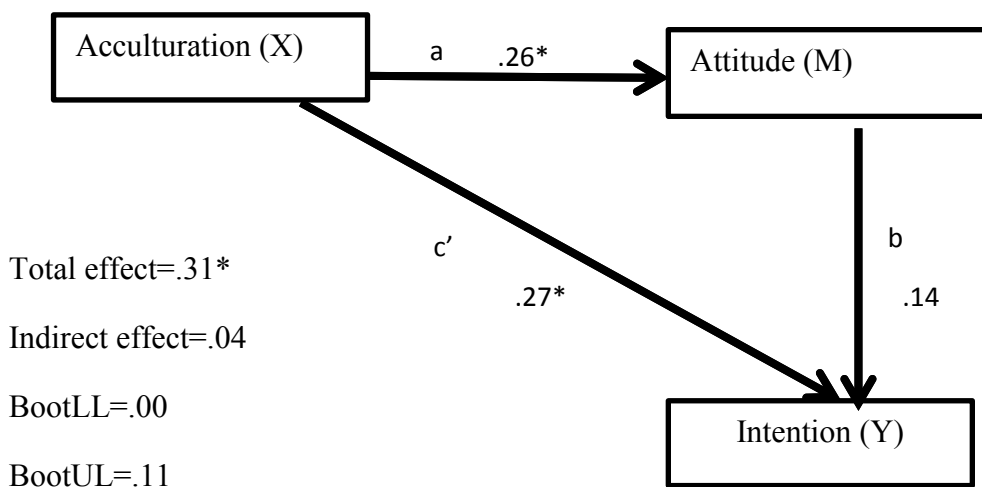


Figure 7. Mediation analysis: attitude as a mediator of the association between acculturation and intention to use condoms (coefficients unstandardized); * $p < .05$

Self-efficacy: Unstandardized regression coefficients are shown in Figure 8. The effect of acculturation on self-efficacy was not significant ($b=.20, p > .05$). However, the path from self-efficacy to behavioral intention was significant ($b=.69, p < .01$). Similarly, the total effect of

acculturation on behavioral intention was significant ($b=.31, p < .05$). The direct effect of acculturation on intention was not significant ($b=.19, p > .05$). Similar to results obtained when attitude was tested as a mediator of acculturation-intention relationship, the indirect effect of acculturation on behavioral intention was not significant $b=.13$ (95% BootCI= -.02-.26). Given that boots confidence interval included zero in the interval, it suggests that self-efficacy did not also mediate the association between acculturation and behavioral intention in this study.

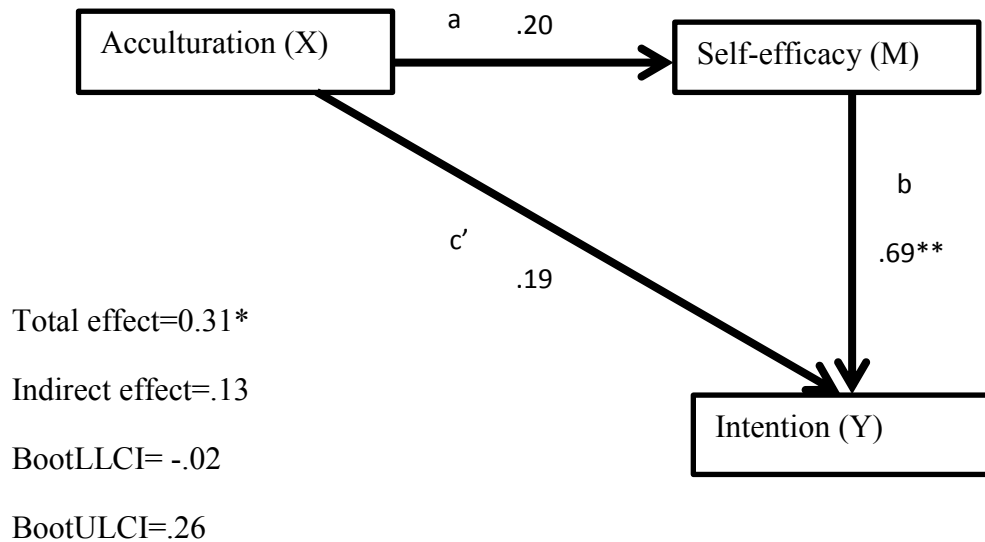


Figure 8. Mediation analysis: self-efficacy as a mediator of the association between acculturation and intention to use condom (coefficients unstandardized); $*p < .05$; $**p < .01$

Model Prediction

Confirmatory Factor Analyses: In order to test if the hypothesized model fits the sample data, both measurement and structural models were estimated. For estimating the measurement model, a confirmatory factor analysis was initially run to estimate the measurement part of the constructs of the hypothesized Integrated Behavioral Model (Model 1). Indicators were loaded on to six factors, namely, attitude, norms, perceived behavioral control, self-efficacy, habit, and intention. Factors were allowed to intercorrelate and error variances estimated. Moreover, based on the information from modification indices, some error terms were correlated to improve model fit. However, the goodness -of-fit indicators for the measurement model of the hypothesized model (Model 1) was inadequate: χ^2 (414, N=201) =827. 41 $p < .0001$, CFI=.89, TLI =.88; RMSEA=.07 (90% confidence interval: .063, .077), and SRMR=.71. Upon examining the average variance extracted (AVE) for each latent variable, it was found that habit had the lowest (AVE=.39) suggesting that it was not adequately explained by the observed variables and as a result was removed from further analysis. Consequently, a confirmatory analysis displayed in Figure 9 was run for the re-specified model (Model 2). Goodness-of-fit for both models are compared in Table 9.

Table 9

Goodness-of-fit indicators for Model 1 and 2: confirmatory factor analyses

Models	χ^2	df	Δdf	χ^2 diff	CFI	TLI	SRMR	RMSEA
Hypothesized Model (Model 1)	827.41***	414			.89	.88	.071	.070
Re-specified Model (Model 2)	264.25***	139	275	563.20**	.95	.94	.055	.067

CFI=comparative fit index; TLI=Tucker-Lewis Index; RMSEA= root-mean-square error of approximation; SRMR=standardized root-mean-square-residual; *** $p < .0001$; ** $p < .001$.

Results indicate that the measurement part of the re-specified model (Model 2) had a better fit than the measurement part of the hypothesized model (Model 1). All factor loadings were significant ($p < .001$) and no evidence of cross loadings. The average variance extracted (AVE) as a measure of construct validity was adequate except for attitude, and all constructs had adequate to high construct reliabilities (Table 10). Intercorrelations between the constructs showed that the strongest association was between intention and self-efficacy ($r = .73, p < .001$) and the weakest was between attitude and norms ($r = .12, p > .05$).

Table 10

Construct validity and reliability: Model 2

Constructs	Average Variance Extracted (AVE)	Construct Reliability (CR)
Attitude	.46	.71
Norms	.69	.93
Perceived behavioral control	.63	.76
Self-efficacy	.57	.70
Intention	.86	.95

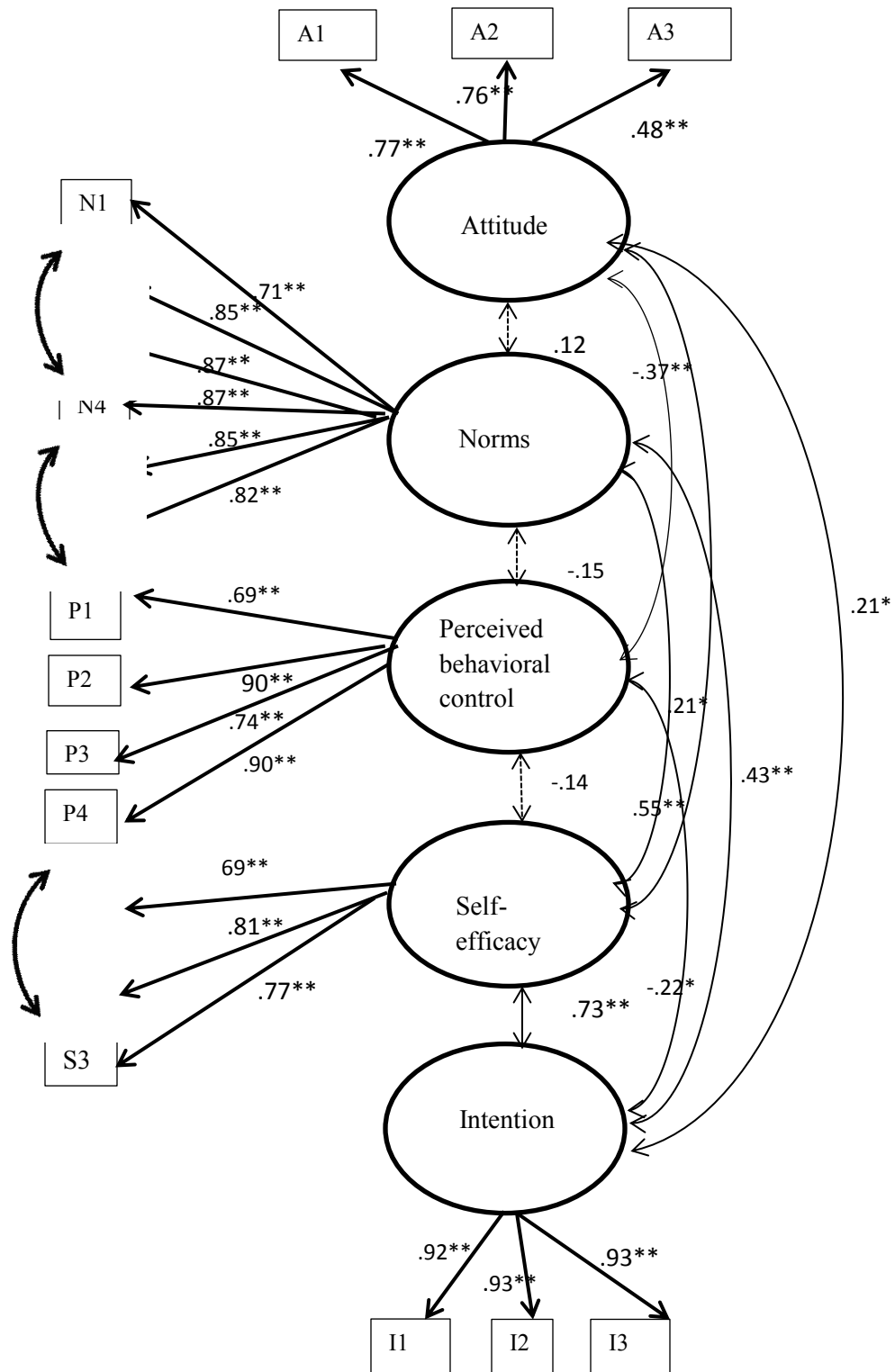


Figure 9: Confirmatory factor analysis: Re-specified (Model 2)

Fit indices: χ^2 (139, N=201) = 264.25 $p < .0001$, comparative fit index = .95, Tucker-Lewis Index = .94; root-mean-square error of approximation = .067 (90% confidence interval: .055, .078), standardized root-mean-square-residual = .055. For simplicity, error terms not displayed. * $p < .01$; ** $p < .001$.

Structural Model: The goodness-of-fit for the full structural models are compared in Table 11. The significant Chi-square difference and the model fit indices: χ^2 (157, N=201) =297.92, $p < .0001$, comparative fit index=.95, Tucker-Lewis Index=.94; root-mean-square approximation=.067 (90% confidence interval: .055, .078), standardized root-mean-square-residual=.056, for the re-specified model (Model 2), suggest that the modified model was a plausible model for this sample. In general, results suggest that Model 2 was adequate in predicting behavioral intention and condom use among East-African immigrants. The intercorrelations and standardized path coefficients are illustrated in Figure 10. Correlations, means, and standard deviations among measured variables are also presented in Table 12.

Table 11

Goodness-of-fit indicators for model 1 and 2: full structure

Models	χ^2	Df	Δdf	χ^2 diff	CFI	TLI	SRMR	RMSEA
Hypothesized Model (Model 1)	895.68***	444			.89	.87	.072	.071
Re-specified Model (Model 2)	297.92***	157	287	597.76**	.95	.94	.056	.067

CFI=comparative fit index; TLI=Tucker-Lewis Index; RMSEA= root-mean-square error of approximation; SRMR=standardized root-mean-square-residual; *** $p < .0001$; ** $p < .001$

Concurring with results of the regression models, self-efficacy emerged as the factor with the strongest and direct influence on intention ($\beta = .68$, $p < .001$). Participants who had higher self-efficacy also had higher intention to use condoms. In turn, intention was a significant predictor of condom use ($\beta = .62$, $p < .001$). However, attitude, norms, and perceived behavioral control did not exert significant influence on intention. Intention accounted for 38% of variance in condom use ($R^2 = .38$, $p < .001$), while attitude, norms, perceived behavioral control, and self-efficacy

explained 54% of the variation in intention to use condoms among East-African immigrants ($R^2=.54, p < .001$).

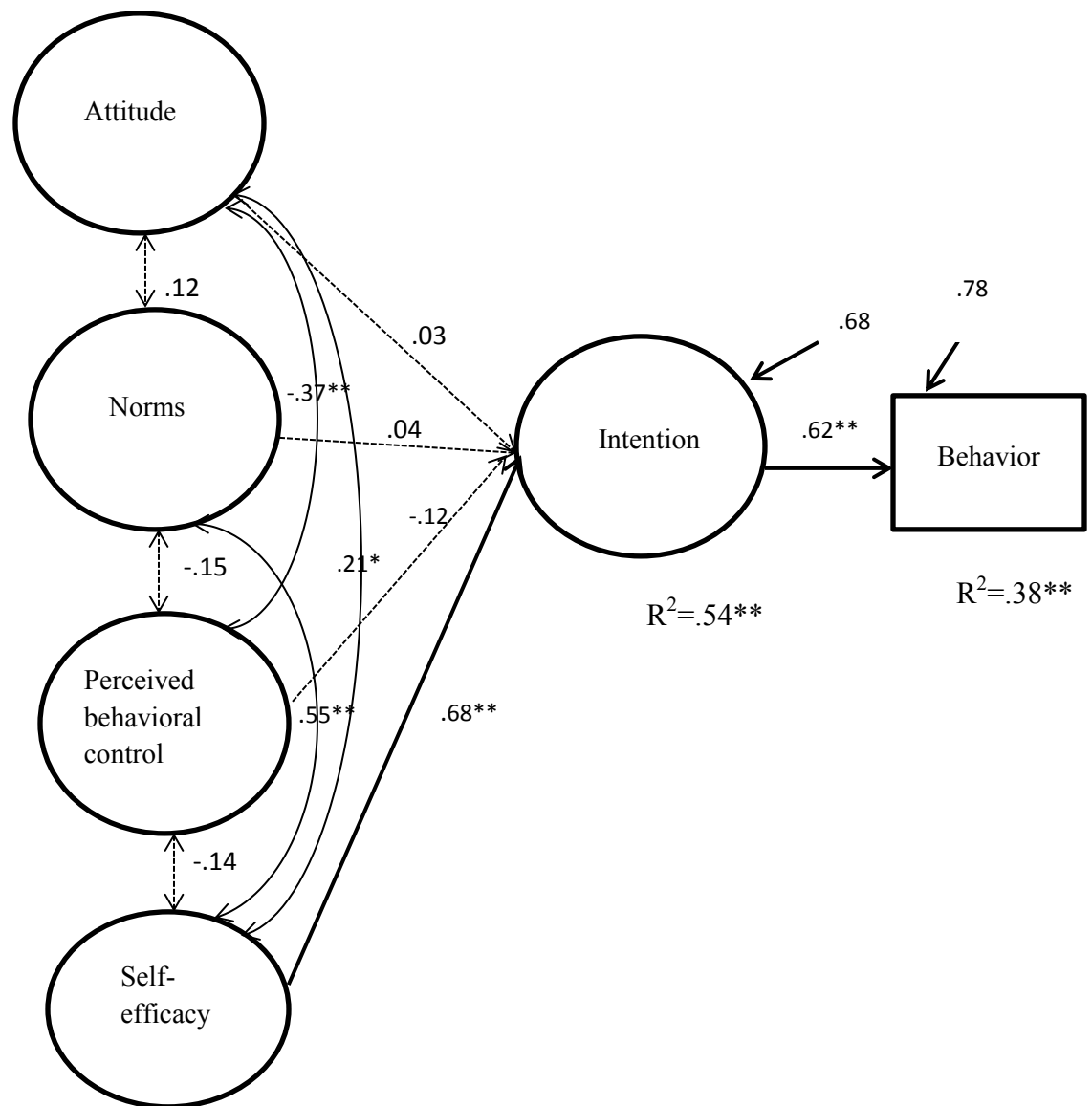


Figure 10. Structural model: re-specified (Model 2)

Fit indices: χ^2 (157, N=201) = 297.92, $p < .0001$, comparative fit index = .95, Tucker-Lewis Index = .94; root-mean-square error of approximation = .067 (90% confidence interval: .055, .078), standardized root-mean-square-residual = .056. * For simplicity, error terms and loading not displayed. * $p < .01$; ** $p < .001$.

Table 12

Measured variables: correlations, means, and standard deviations

Indicators	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21
1. A1	-																			
2. A2	.60	-																		
3. A3	.33	.36	-																	
4. N1	.16	.22	.2	-																
5. N2	.02	.04	.06	.68	-															
6. N3	.01	.05	.11	.66	.85	-														
7. N4	.02	.02	.20	.55	.72	.74	-													
8. N5	.11	.08	.22	.54	.71	.75	.75	-												
9. N6	.08	.01	.19	.55	.69	.67	.77	.80	-											
11. P1	-.36	-.24	-.30	-.22	-.07	-.04	-.10	-.13	-.10	-										
12. P2	-.25	-.21	-.23	-.19	-.11	-.08	-.05	-.19	-.11	.60	-									
13. P3	-.21	-.11	-.21	-.11	-.08	-.02	-.01	-.02	-.05	.55	.66	-								
14. P4	-.23	-.21	-.28	-.12	-.11	-.06	-.08	-.21	-.13	.59	.80	.66	-							
15. S1	.08	.09	.19	.35	.31	.36	.30	.32	.30	-.03	-.03	.06	-.09	-						
16. S2	.11	.14	.21	.32	.39	.42	.39	.35	.36	-.07	-.11	-.03	-.16	.79	-					
17. S3	.07	.10	.23	.44	.36	.39	.34	.37	.27	-.11	-.12	.04	-.06	.53	.62	-				
18. I1	.13	.21	.18	.45	.42	.38	.34	.39	.31	-.22	-.24	-.17	-.22	.48	.58	.50	-			
19. I2	.07	.11	.21	.38	.38	.34	.27	.33	.24	-.16	-.19	-.10	-.19	.47	.53	.54	.85	-		
20. I3	.15	.13	.18	.34	.36	.31	.26	.33	.30	-.12	-.16	-.12	-.15	.42	.53	.49	.86	.87	-	
21. Behavior	.14	.14	.19	.30	.34	.29	.31	.34	.23	-.05	-.14	-.16	-.16	.24	.36	.29	.54	.57	.60	-
Mean	3.19	2.89	3.47	3.14	3.20	3.40	3.43	3.48	3.43	2.48	2.34	2.43	2.34	3.39	3.46	3.33	3.22	3.22	3.21	3.03
SD	1.52	1.32	1.35	1.34	1.30	1.34	1.27	1.10	1.19	1.21	1.18	1.30	1.26	1.23	1.12	1.17	1.20	1.22	1.24	1.23

Note: Attitude was measured by three items (A1-A3), norms were measured by six items (N1-N6), perceived behavioral control was measured by six items (P1-P4),

Self-efficacy was measured by five items (S1-S3), behavioral intention was measured by three items (I1-I3), and condom use behavior was measured by a single item (behavior).

In summary, self-efficacy emerged as the factor with the strongest and direct influence on intention to use condoms ($\beta=.68, p <.001$). In turn, intention was a significant predictor of self-reported condom use ($\beta=.62, p <.001$). Behavioral intention accounted for 38% of variance in self-reported condom use ($R^2=.38, p <.001$). Together, attitude, norms, perceived behavioral control, and self-efficacy explained 54% of the variation in behavioral intention ($R^2=.54, p <.001$). Attitude and self-efficacy did not mediate the association between acculturation and behavioral intention. However, acculturation directly and significantly ($\beta=.16, p <.05$) influenced condom use. Of the main variables, descriptive norms ($\beta=.20, p <.01$), injunctive norms ($\beta=.18, p <.01$), and instrumental attitude ($\beta=.17, p <.05$) had direct and significant influence on condom use. Self-efficacy did not significantly influence ($\beta=.14, p >.05$) condom use.

CHAPTER 5: DISCUSSION

Overview

The study examined the relationship between the independent variables (attitude, norms, perceived behavioral control, self-efficacy, acculturation, and habit), and dependent variables (behavioral intention and self-reported condom use) in steady heterosexual relationships among East-African immigrants. Moreover, the mediational roles of two factors (attitude and self-efficacy) in acculturation-intention relationships were explored. Finally, the plausibility of the Integrated Behavioral Model (IBM) was tested.

Discussion of the Results

Participants, who were low intenders and users of condoms, showed less favorable attitude toward condom use, experienced less social influence about condom use, and exhibited low self-efficacy in using condoms. Similarly, participants did not form strong habits of using condoms and had low levels of acculturation, but reported little difficulties in using condoms. The study was consistent with previous research reports from sub-Saharan Africa (Belachew, 2002; Cherutich et al., 2008; Maharaj & Cleland, 2004; Molla, Astrom, & Brehane, 2007) and African immigrants living in the U.S. and Europe (Barrett & Mulugeta, 2010; Lazarus et al., 2006; Rosenthal et al., 2003; Tompkins et al., 2006). Clearly, participants in this study did not form strong intention to use condoms. The observed low level of condom use among study participants may be reflective of the perceived notion that condom use is expected in casual sexual encounters, but not in steady relationships (Molla, Astrom, & Brehane, 2007; Warren & Philpott, 2003), or it could be because of the lower perceived risks for HIV transmission in the U.S. than their countries of birth (Beyene, 2004). Moreover, when immigrants move to a new

country they may also bring values, beliefs, and cultures that could negatively influence condom use (Omorodion et al., 2007).

In a meta-analysis, Albarracin et al. (2001) reported medium to large correlations between condom use and intention, and intention and perceived behavioral control ($r=.05$). Moreover, attitude strongly associated with intention ($r=.58$); however, the correlation between perceived behavioral control and condom use was small to medium ($r=.25$). In the current study, intention strongly correlated with self-efficacy and condom use. However, the correlation with norms, instrumental attitude, and affective attitude was between medium and large size. The small to medium size correlation observed between attitude (measured directly) and intention may have been due to the attenuation effect of measurement error because the low reliability ($\alpha=.69$) for attitude may have weakened the true relationship between the variables (Fan, 2003). However, small correlation between attitude and intention was reported among adolescents in South Africa (Boar & Mashamba, 2005). Conversely, medium to large correlations between intention and attitude were also reported from several African populations (Fekadu & Kraft, 2001; Molla, Astrom, & Brehane, 2007; Lugoe & Rise, 1999). As expected, intention strongly and positively associated with condom use ($r=.57$) accounting for 32% and 38% of the variation in condom use, in bivariate and multivariate analyses, respectively (Table 6 & Figure 8). Sheeran (2002) reported an average correlation of ($r=.53$, range .4-.82) between intention and behavior accounting for 28% (range 16% -38%) of variation in behavior. The results of the present study fell well within the range reported in the above study. Similarly, there was a large and positive correlation between self-efficacy and intention, but the relatively lower correlation between self-efficacy and condom use may suggest that the relationship between self-efficacy and condom use may have been mediated by intention. Conversely, perceived behavioral control weakly

correlated with behavioral intention and condom use. The results suggest that perceived behavioral control was a weak predictor of behavioral intention and condom use in this study. This finding is consistent with previous research reports (Bennett & Bozionelos, 2000; Boar & Mashamba, 2005).

Participant's religious affiliation and site significantly influenced condom use (model 3 and model 4). Muslim participants were more likely to report condom use in last 12 months than participants of Christian or other faiths. The plausible explanation for the difference may be that many participants of Christian faith in the study may have been more conservative than participants who were Muslims. It could also be due to differences in the length participants lived in the U.S. Participants who said they were Muslims had lived in the U.S. two-years longer than participants who reported to be Christians. The result was, however, in contrast to other research findings from Africa where difference in acceptability of condom use was not associated to one's religious affiliation (Muula, 2010; Muula et al., 2011). With regard to site, participants from metro area were more likely to use condoms in the last 12 months than participants from outside the metro area. However, the effect of site may have been confounded with differences arising from country of origin of the immigrants because majority of participants from metro area were Ethiopians and those from outside metro were predominately Somalis.

Behavioral intention and self-reported condom use were significantly predicted by the models tested and were consistent with results reported in earlier findings (Boer & Mashamba, 2005; Fekadu & Kraft, 2001; Molla, Astrom, & Brehane, 2007; Lugoe & Rise, 1999). In this study, the Theory of Planned Behavior (TPB) explained 28 and 26% of the variation in behavioral intention and self-reported condom use, respectively. These figures are lower than

what were reported in previous findings. For example, TPB accounted for 36% of variance in intention to use condoms among Ethiopian adults (Molla, Astrom, & Brehane, 2007). Similarly, TPB accounted for 42% of the variance in intention to use condom among Tanzanian students (Lugoe & Rise, 1999). However, lower predictive validity of TPB (accounting for 17% of the variation in intention to use condoms) was reported among black adolescents in South Africa (Boer & Mashamba, 2005). In this study, among constructs of TPB, attitude and normative factors independently predicted behavioral intention and condom use. However, in general, TPB was only moderately effective in predicting behavioral intention among East-African immigrants in Minnesota. The reason being is that that other factors, mainly self-efficacy were important in predicting intention to use condoms in this population.

The predictive value of the model (model 3) increased when self-efficacy was included. Self-efficacy further accounted for 8.3% of the variation in behavioral intention, and had the strongest influence on intention. However, self-efficacy only accounted for 1.2% of the variance in self-reported condom use because the effect of self-efficacy may have been mediated by behavioral intention. The results are consistent with earlier reports from the U.S. and sub-Saharan Africa countries (Knipper et al., 2007; Schaalma et al., 2009). Interestingly, results of the structural equation modeling confirmed that behavioral intention was mainly under the direct influence of self-efficacy. In turn, intention significantly mediated the relationship between self-efficacy and self-reported condom use. In general, the fit indices $\chi^2 (157, N=201) = 297.92, p < .0001$, comparative fit index=.95, Tucker-Lewis Index=.94; root-mean-square approximation=.067 (90% confidence interval: .055, .078), standardized root-mean-square-residual=.056, suggest that the re-specified model (model 2) adequately fit the data. The model also accounted for 54% of the variation in behavioral intention to use condoms.

Perceived behavioral control was less important in predicting the intention to use condoms among East-African immigrants (Figure 8). The effect of attitude and norms on intention was not consistent. Significant results were obtained in the regression model, but the effects disappeared when structural equation modeling was used. Attitude and self-efficacy were reported to be more powerful than social norms and perceived behavioral control in predicting intended and self-reported condom use (Bennett & Bozionelos, 2000). The inconsistency of the effect of attitude on intention may suggest that participants might not have yet fully formed strong attitude toward condom use (Boer & Mashamba, 2005). Moreover, changing attitude may be challenging as it entails the modification of the underlying health beliefs that were shaped by individuals' social, cultural, and religious values. The results are consistent with earlier findings from South Africa and Ethiopia (Boer & Mashamba, 2005; Fekadu & Kraft, 2001).

Conversely, attitude, norms, perceived behavioral control, and self-efficacy had direct influence on condom use. According to TPB and IBM, these factors are mediated by intention (Ajzen, 1991; Fishbein, 2000; IOM, 2002; Montano & Kasprzyk, 2008). In other words, for these factors to cause a behavior, one has to first intend to perform the behavior in question. However, direct effects of psychosocial factors on behavior have been hypothesized in the information-motivation-behavioral skills model, IMB (Fisher & Fisher, 1992). The model posits that HIV preventive behaviors are influenced by the knowledge about modes of HIV transmission and prevention, the motivation to change the risk behavior, and the behavioral skills to perform specific HIV prevention method (Fisher & Fisher, 1992). In IMB, intention, attitude, and norms are included under the motivation to change, and can influence HIV prevention behavior such as condom use directly, or indirectly through their effect on behavioral skills. For example, direct effect of self-efficacy on condom use was reported among African-American and

Ugandan adolescents (Robertson, Stein, & Baird-Thomas, 2006; Ybarra, Korchmaros, Kiwanuka, Bangsberg, & Bull, 2013).

Acculturation independently and significantly predicted condom use and consistent with earlier reports (Afaible & Brindis, 2006; Marin, Tschann, Gomez, & Kegeles, 1993). However, neither intention nor condom use was influenced by condom use habits. The addition of acculturation and habit in the model (model 4) failed to account for additional variation in intention and only contributed 3% of variance in condom use. The lack of significant effect of habit is inconsistent with findings of previous studies (Protogerou & Tuner-Cobb, 2011; Molla, Asrtom, & Brehane, 2007; Trafimow, 2000). One explanation for this discrepancy could be that these studies measured condom use habit differently with a single or two-item question, whereas in the current study, habit was measured by a 12-item Self-Reported Habit Index (SRHI) that assessed recurrence and automaticity of a behavior (Verplanken & Orbell, 2003). It is also plausible that condom use, particularly among Somali immigrants may have been a novel behavior primarily determined by intentions rather than by habit. Triandis (1977) asserts that new behaviors are generally determined by intentions, but when repeated, behaviors are mainly under the influence of habit, hence depending less on conscious or planned decisions. A survey of 1,018 internally displaced people in Somalia showed that only 12% had ever used a condom (UNGASS, 2010). It could also be that some participants may have not fully understood condom use in the context of steady heterosexual relationship, and instead, responded to the questions in a casual sexual relationship context. Habit significantly predicted intention to use condoms when people perceive themselves to be in steady or exclusive sexual relationship (Protogerou & Tuner-Cobb, 2011).

The existing social cognitive theories do not consider acculturation as a direct antecedent of a behavior (Bandura 1986; Bandura, 1994; Fishbein, 2000), thus the mechanism through which acculturation influences health behaviors is not well understood (Abraido-Lanza et al., 2006). In this study, attitude toward condom use and condom use self-efficacy did not mediate the acculturation-intention relationship. However, consistent with earlier research reports, acculturation had direct and significant influence on condom use (Afable & Brindis, 2006; Marin et al., 1993). Increased language proficiency associated with higher acculturation levels may facilitate easy access to health education and information, leading to increased condom use among East-African immigrants.

The concept of self-efficacy is an important component of health behavior change (Bandura, 1998). Self-efficacy refers “to beliefs in one’s capability to organize and execute the course of action required to produce given levels of attainments” (Bandura, 1998, p. 624). It is also a belief that one can perform a certain behavior even under difficult circumstances (Bandura, 1986; Bandura, 1994). In this study self-efficacy emerged as the strongest variable in predicting condom use. Strengthening condom use self-efficacy among East-African immigrants is suggested as a main component of public health interventions seeking to curb the spread of HIV and other STIs in Minnesota mainly through health education that include HIV transmission knowledge, condom use negotiation, and communication skills. Lower condom use self-efficacy was associated with lower self-reported condom use (Sayles et al., 2006). For example, an intervention to increase self-efficacy by improving self-esteem, assertiveness, skills, and confidence in condom use among South African adolescents was found to be effective in increasing condom use self-efficacy (Coffman, Smith, Flisher, & Caldwell, 2011).

Research implications of the study

African-born immigrants in the U.S. are at increased risk of HIV infection. The most effective way of preventing the acquisition and the spread of HIV infection is by consistent and correct condom use. The results of this study showed limited use of condoms among East-African immigrants. However, the IBM was useful in identifying factors associated with condom use in this population. The direct influence of self-efficacy on intention has important practical implication for researchers and public health workers. Since self-efficacy was the strongest cognitive factor associated with intention to use condoms, interventions should be designed to enhance condom use self-efficacy through methods such as mastery experience, social modeling, or persuasions (Bandura, 1998). For example, methods such as peer education in which trained and motivated individuals conduct informal educational activities with their peers is valuable in enhancing knowledge, changing attitudes, beliefs, and skills, thus empowering peers to take preventive measures (UN Interagency Group on Young People's Health, 2003; Ibrahim, Rampal, Jamil, & Zain, 2012). Peer education training can also enhance self-efficacy through practice because when misconception and opposition to condom use are widespread, merely providing health education is less likely to change health behavior (Majumdar & Roberts, 1998; Mahat, Scoloveno, & Ayres, 2011). Moreover, research suggests that people are more likely to ascribe information, if they think the messenger is similar to them (Sloane & Zimmer, 1993). This may help empower community members increase health awareness that can be integrated into the existing belief structures and bring about changing behaviors (Bond, Valente, & Kendall, 1999). Moreover, interventions to increase condom use among immigrants should not ignore the role of acculturation as well because it appears that acculturation levels influence condom use. This may suggest that public health intervention strategies should also incorporate interventions

that enhance cultural integration through expanded English language training and sexual health education tailored to the unique cultural and religious values of the immigrants.

Limitations of the Study

There were some limitations to this study. The study was cross-sectional, thus conclusions could not be made about causal relationships. Moreover, participants were not randomly selected, but volunteered to participate in this study. As a result, the external validity and generalizability of the results may be limited to the study population. However, the results could be relevant to similar immigrant populations in the U.S. Further, the study relied on self-reported measures. Therefore, its validity depends on the degree to which participants provided reliable information. Furthermore, relationship status, past HIV/STI status, and sexual practices were not assessed.

Strengths of the study

There were several strengths of the study. The study had a good internal validity. First, in order to minimize errors during the data collection phase, participants were given instruction on how to properly fill out the questionnaire. Second, before parameters were estimated, the effects of demographic variables were controlled. Third, in order to reduce biases in parameter estimates, missing values were estimated through multiple imputations. Fourth, the effect of socially desirable responding was accounted for, and results showed no evidence of widespread presence of participants providing socially desirable responses. Fifth, before analyzing the data, the presence of common method bias that may arise from using same questionnaire to measure the dependent and independent variables at the same time was tested. Our analyses showed no evidence of substantial common method bias. Finally, data were analyzed by regression and structural equation modeling, and results counterchecked.

Future Directions

The low prevalence of condom use among East-African immigrants calls for further research. Longitudinal studies that are directed at identifying the most effective way of enhancing condom use self-efficacy are warranted. Moreover, the observed direct effects of psychosocial factors such as attitude and norms on condom use may suggest that future research should be directed at examining the applicability of IMB among East-African immigrants. Research should also be geared toward isolating elements of acculturation that may influence condom use. It is also important to understand and examine if cultural and language barriers constrain immigrants' access to health education and information. Moreover, future research should also examine how existing ethnic media outlets could be utilized to disseminate health education information among East-African immigrants. Finally, it is useful to implement programs that make use of community resources and networks in preventing HIV infection among the wider immigrant communities in Minnesota.

Conclusions

Study participants were low intenders and users of condom. They showed less favorable attitude, experienced less social influence, exhibited low self-efficacy, and lacked strong habits of using condoms. Self-efficacy emerged as the strongest cognitive variable exerting direct and significant influence on behavioral intention. Interventions should be designed to enhance condom use self-efficacy among East-African immigrants in Minnesota.

REFERENCES

- Acock, A.C. (2005). Working with missing data. *Journal of Marriage and Family*, 67, 1012-1028.
- Adams, S. A., Matthews, C.E., Ebbeling, C.B., Moore, C. G., Cunningham, J. E., Fulton, J. et al. (2005). The effect of social desirability and social approval on self-reports of physical activity. *American Journal of Epidemiology*, 161 (4), 389-398.
- Abraido-Lanza, A.F., Ambrister, A. N., Florez, K. R., & Aguirre, A. N. (2006). Toward a theory-driven model of acculturation in public health research. *American Journal of Public Health*, 96 (8), 1342-1346.
- Abraido-Lanza, A.F., Chao, M.T., & Florez, K.R. (2005). Do healthy behaviors decline with greater acculturation? Implications for the Latino mortality paradox. *Social Sciences and Medicine*, 61, 1243-1255.
- Adrien, A., Cox, J., Leclerc, P., Boivin, J., Archibald, C., Boulos, D., Jean-Gilles et al. (2010). Behavioral risks for HIV infection among Quebec residents of Haitian origin. *Journal of Immigrant Health*, 12, 894-899.
- Afable-Munsuz, A., & Brindis, C.D. (2006). Acculturation and the sexual reproductive health of Latino youth in the United States: a literature review. *Perspectives on Sexual and Reproductive Health*, 38(4), 208-219.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32, 665-683.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal directed behavior: attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- Ajzen, I., Joyce, N., Sheikh, S., & Cote, N. G. (2011). Knowledge and the prediction of behavior: the role of accuracy in the theory of planned behavior. *Basic and Applied Social Psychology*, 33, 101-117.
- Albarracin, D., Fishbein, M., Johnson, B. T., Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: a meta-analysis. *Psychological Bulletin*, 127 (1), 142-161.
- Albarran, C.R., Nyamathi, A. (2011). HIV and Mexican migrant workers in the United States: a review applying the vulnerable populations conceptual model. *Journal of the Association of Nurses in AIDS Care*, 22 (3), 173-185. doi:10.1016/j.jana.2010.08.001.

- Amherst Wilder Foundation (n. d.). Immigration in the Twin-cities: ten things to know. Retrieved November 30, 2012, from <http://www.wilder.org/economy0.0.html>.
- Anders, L., Olson, T., Robinson, K., Wiebe, J., DiGreariorio, Guillermina, et al. (2010). A health survey of a colonia located on the west Texas, US/Mexico border. *Journal of Immigrant Health, 12*(3), 361-369.
- Armitage, C., & Conner, M. (2001). The efficacy of the theory of planned behavior: a meta-analytic review. *British Journal of Psychology, 40*, 471-499.
- Armitage C.J., & Christian, J. (2004). From attitude to behavior: Basic and applied research on the theory of planned behavior. In C.J. Armitage & J. Christian (Eds.). *Planned behavior: The relationship between human thoughts and action*. New Brunswick, New Jersey: Transaction Publisher.
- Bandura, A. (1986). *Social foundations of thoughts and action: a social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1994). Social cognitive theory and exercise of control over HIV infection. In: R.J. DiClemente, & J. L. Peterson (Eds.). *Preventing AIDS: Theories and methods of behavioral interventions* (pp. 25-60). New York: Plenum Press.
- Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology & Health, 13* (4), 623-649.
- Barona, A., & Miller, J. A. (1994). Short acculturation scale for Hispanic youth (SASH-Y): a preliminary report. *Hispanic Journal of Behavioral Sciences, 16*(2), 155-162.
- Barrett, H. R., & Mulugeta, B. (2010). Human immunodeficiency virus (HIV) and migrant “risk environments.” The case of the Ethiopian and Eritrean immigrant community in the West Midlands of the U.K. *Psychology, Health, & Medicine, 15* (3), 357-369.
- BBC (2009, March 29). Pope ‘distorting condom science. Retrieved November 5, 2012, from <http://news.bbc.co.uk/2/hi/7967173.stm>. BBC News.
- Beckwith, C. G., DeLong, A. K., Desjardins, S. F., Gillani, F., Bazerman, L., Mitty, J. A. et al. (2009). HIV infection in refugees: a case-control analysis of refugees in Rhode Island. *International Journal of Infectious Diseases, 13*, 186-192.
- Belachew, B.A. (2002, July). Factors affecting accessibility and utilization of condom in Ethiopia[Abstract]. International Conference on AIDS. Addis Ababa, Ethiopia.
- Bennett, P., & Bozionelos, G. (2000). The theory of planned behavior as predictor of condom use: a narrative review. *Psychology, Health, & Medicine, 5*(3), 307-326.

- Berg, S. (2010). Census 2010: Can a metro area so sharply divided by income, race and geography continue to thrive on the national stage? Retrieved March 12, 2013 from <http://www.minnpost.com/cityscape/2010/12/census-2010-can-metro-area-so-sharply-divided-income-race-and-geography-continue-t..>
- Berry, J. W. (1980). *Acculturation as varieties of adaptation*. In A. M. Padilla (ed.) *Acculturation: Theory models and some new findings* (pp. 9-25). Boulder CO: West view.
- Beyene, Y. (2004). Potential HIV risk behaviors among Ethiopians and Eritreans in the Diaspora: a bird's eye-view. *North East-African Studies*, 9 (2), 119-142. doi: 10.1353/nas.2004.0014.
- Bogale, G.W., Boer, H., & Seydel, E. R. (2010). Condom use among low-literate, rural females in Ethiopia: the role of vulnerability to HIV infection, condom attitude, and self-efficacy. *AIDS Care*, 22 (7), 851-857.
- Boer, H., & Mashamba, M. T. (2005). Psychosocial correlates of HIV protection motivation among Black adolescents in Venda, South Africa. *AIDS Education and Prevention*, 17 (6), 590-602.
- Bollen, K.A., & Stine, R. (1990). Direct and indirect effects: classical and bootstrap estimates of variability. *Social Methodology*, 20, 115-140.
- Bond, K. C., Valente, T. W., & Kendall, C. (1999). Social network influences on reproductive health behaviors in urban northern Thailand. *Social Science and Medicine*, 49, 1599-1614.
- Bosompra, K. (2001). Determinants of condom use intentions of university students in Ghana: an application of the theory of reasoned action. *Social Science & Medicine*, 52, 1057-1069.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen, & J.S. Long (Eds.). *Testing structural equation models* (pp.136-162). Newbury Park CA: Sage.
- Burns, F.M., Evans, A.R., Mercer, C.H., Parutis, V., Gerry, C.J., Mole, R.C.M. et al. (2011). Sexual and HIV risk behavior in Central and Eastern European migrants in London. *Sexually Transmitted Infections*, 87, 318-324.
- Burns, F. M., Imrie, J., Nazroo, J. Y., Johnson, A. M., & Fenton, K. A. (2007). Why the(y) wait? Key informant understandings of factors contributing to late presentation and poor utilization of HIV health and social care services by African migrants in Britain. *AIDS Care*, 19 (1), 102-108.
- Byrne, B. (2011). *Structural equation modeling with Mplus: Basic concepts, application, and programming*. New York: Taylor & Francis Group.

- Camarota, S. A. (2012). Immigrants in the United States: a profile of America's foreign-born population. Center for Immigrant Studies. Retrieved March 1, 2013 from <http://www.cis.org/articles/2012/immigrants-in-the-united-states-2012.pdf>
- Cates, W. (2001). "The NIH condom report: the glass is 90% full." *Family Planning Perspectives*, 33 (5), 231-233.
- Cartwright, C. P. (2006). The changing epidemiology of HIV/AIDS at a Minnesota Hospital: impact of demographic change and viral diversity. *Journal of Medical Virology*, 78, S19-S21.
- CDC (2011). HIV in the United States: an overview. National Center for HIV/AIDS, viral hepatitis, STD, and STD, and TB prevention. Division of HIV/AIDS Prevention. Retrieved October 25, 2012 from, <http://www.cdc.gov/hiv/topics/surveillance/resources/factsheets/incidence-overview.htm>.
- Central Statistical Agency & ORC Macro (2006). Ethiopia demographic and health survey 2005. Retrieved June 24, 2012 from, <http://www.measuredhs.com/pubs/pdf/FR179/FR179.pdf>.
- Cherutich, P., Brentlinger, P., Nduati, R., Kiarie, M. J., & Farquhar, C. (2008). Condom use among sexually active Kenyan female adolescents at risk for HIV-1 infection. *AIDS Behavior*, 12, 923-929.
- Chimbiri, M. A. (2007). The condom is an 'intruder' in marriage: evidence from rural Malawi. *Social Science & Medicine*, 64, 1102-1115.
- Choi, K.H., Wong, F., & Sy, F.S. (2005). HIV/AIDS among Asians and Pacific Islanders in the United States. *AIDS Education and Prevention*, 17 (5) iii-v.
- CIA Fact Book (2011). The World Fact Book. Retrieved September 15, 2012 from, <https://www.cia.gov/library/publications/the-world-factbook/>.
- Coffman, D. L., Smith, E. A., Flisher, A J., & Caldwell, L. L. (2011). Effects of HealthWise South Africa on condom use self-efficacy. *Prevention Science*, 12 (2), 162-172.
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: a review and avenues for further research. *Journal of Applied Social Psychology*, 28, 1429-1464.
- Craighead, C.W., Ketchen, D.J., Dunn, K.S., & Hult, G.T.M. (2011). Addressing common method variance: guidelines for survey research on information technology, operations, and supply chain management. *IEEE Transactions on Engineering Management*, 58 (3), 578-588.
- Crawford, T., Caldwell, G., Bush, H. M., Browning, S., & Thornton, A. (2011). Foreign-born status and HIV/AIDS: Characteristics among foreign and U.S. born individuals. *Journal*

- of Immigrant Minority Health*. doi: 10.1007/s10903-011-9455-8.
<http://www.springerlink.com/content/w41hl22w51233263/>.
- Davies, P. (2004, September). Faces of change. *Fedgazette*, September 2004 Issue. Retrieved November 25, 2012 from,
http://minneapolisfed.org/publications_papers/pub_display.cfm?id=1595.
- Del Amo, J., Broring, G., Hamers, F. F., Infuso, A., & Fenton, K. (2004). Monitoring HIV/AIDS in Europe's immigrant communities and ethnic minorities. *AIDS*, 18, 1867-1873.
- DiClemente, R. J., Durbin, M., Siegel, D., Krasnovsky, F., & Lazarus, N. (1992). Determinants of condom use among junior high school students in minority inner-city school district. *Pediatrics*, 89 (2), 197-2002.
- Dinkelman, T., Levinsohn, J., & Majelantle, R. (2006). When knowledge is not enough: HIV/AIDS information and risky behavior in Botswana. Research Seminar in International Economics. Gerald R. Ford School of Public Policy. The University of Michigan. Ann Arbor, Federal Democratic Republic of Ethiopia Population Census Commission (2008). Retrieved September 12, 2012 from
http://www.csa.gov.et/pdf/Cen2007_firstdraft.pdf.
- Dixon, D. (2006). Characteristics of the African-born in the United States. Migration Information Sources. Migration Policy Institute. Retrieved November 10, 2012 from,
<http://www.migrationinformation.org/usfocus/display.cfm?ID=366#4>.
- Decosas, J., Kane, F., Anarfi, J. K., Sodji, K. D. R., & Wagner, H. U. (1995). Migration and AIDS. *The Lancet*, 346, 826-828.
- Drummond, D., Mizan, A., & Wright, B. (2008). HIV/AIDS knowledge and attitudes among West African immigrant women in Western Australia. *Sexual Health*, 5(3), 251-259.
- Eaton, L., Flisher, A. J., & Aaro, L. E. (2003). Unsafe sexual behavior in South African youth. *Social Science & Medicine*, 56, 149-165.
- Ellison, J., Jandorf, L., & Dahumel, K. (2011). Assessment of the short acculturation scale for Hispanics (SASH) among low-income, immigrant Hispanics. *Journal of Canadian Education*, 26, 478-483.
- Emilio, A., Chenoa, P., Flippen, A., & McQuiston, C. (2004). Use of commercial sex workers among Hispanic migrants in North Carolina: Implications for the spread of HIV. *Perspectives on Sexual and Reproductive Health*, 36(4), 150-156.
- Encyclopedia of the Nations (2010). Ethiopia. Retrieved September 15, 2012 from,
<http://www.nationsencyclopedia.com/economies/Africa/Ethiopia.html>.

- Fan, X. (2003). Two approaches for correcting correlation attenuation caused by measurement error: Implications for research practice. *Educational and Psychological Measurement*, 63, 915-930. doi:10.1177/001316440325131910.1177/0013164403251319.
- Fekadu, Z., & Kraft, P. (2001). Predicting intended contraception in a sample of Ethiopian female adolescents: the validity of theory of planned behavior. *Psychology and Health*, 16, 207-222.
- Fennelly, K., & Huart, A. (2009). The economic impact immigrants in Minnesota. Report to the Minnesota Business Immigrant Coalition. Retrieved March 1, 2013 from <http://www.immigrationworksusa.org/uploaded/file/Net%20Economic%20Impact%20of%20Immigrants%20in%20MN%20report%20.pdf>.
- Fishbein, M. (1967). *Reading in attitude theory and measurement*. New York: Wiley.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Fishbein, M. (2000). The role of theory in HIV prevention. *AIDS Care*, 12(3), 273-278.
- Fisher, J.D., & Fisher, W. A. (1992). Changing AIDS- risk behavior. *Psychological Bulletin*, 11(3), 454-472.
- Ford, K., & Norris, A. E. (1993). Urban Hispanic adolescents and young adults: relationship of acculturation to sexual behavior. *Journal of Sex Research*, 30 (4), 316-323.
- Foley, E. E. (2005). HIV/AIDS and African immigrant women in Philadelphia: structural and cultural barriers to care. *AIDS Care*, 17 (8), 1030-1043.
- Foreign & Commonwealth Office (2011). Somalia country information. Retrieved September 15, 2012 from, <http://www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/country-profile/sub-saharan-africa/somalia?profile=history>.
- Francis, J. J., Eccles, M. P., Johnston, M., Walker, A., Grimshaw, J., Foy, R. et al. (2004, May). Constructing questionnaires on theory of planned behavior. A manual for health service researches. Center for Health Services Research. University of New Castle. UK. Retrieved February 1, 2013 from http://pages.bangor.ac.uk/~pes004/exercise_psych/downloads/tpb_manual.pdf.
- French, D. P., Sutton, S., Hennings, S.J., Mitchell, J., Wareham, N.J., Griffin, S. et al. (2005). The importance of affective beliefs and attitudes in the theory of planned behavior: predicting intention to increase physical activity. *Journal of Applied Social Psychology*, 35 (9), 1824-1848.
- Fritz, M.S., & MacKinnon, D.P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18, 233-239.

- Ganster, D.C., Hennessey, H.W., & Luthans, F. (1983). Social desirability response effect: three alternative models. *Academy of Management Journal*, 26 (2), 321-331.
- Gardner, B., Bruijn, G., & Lally, P. (2011). A systematic review and meta-analysis of applications of the self-reported habit index to nutrition and physical activity behaviors. *Annals of Behavioral Medicine*, 42, 174-187.
- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice*. 4th Ed. California: Jossey-Bass.
- Godin, G., Adrien, A., Williams, D., Maticka-Tyndale, E., Manson-Singer, S. et al. (1996). Cross-cultural testing of three social cognitive theories: an application to condom use. *Journal of Applied Psychology*, 26, 17, 1556-1586.
- Hall, H. I., Byers, R. H., Ling, Q., & Espinoza, L. (2007). Racial/ethnic and age disparities in HIV prevalence and disease progression among men who have sex with men in the United States (2007). *American Journal of Public Health*, 97(6), 1060-1066.
- Harawa, N. T., Bingham, T. A., Cochran, S. D., Greenland, S., & Cunningham, W. E. (2002). HIV prevalence among foreign and U.S. born clients of public STD clinics. *American Journal of Public Health*, 92 (12), 1958-1963.
- Hayes, A. F. (2009). Beyond Baron and Kenny: statistical mediation analysis in the new millennium. *Communication Monographs*, 76 (4), 408-420.
- Hayes, A. F. (2012). SPSS PROCESS documentation. Retrieved January 30, 2013 from <http://www.afhayes.com/public/process.pdf>.
- Hair, J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (7th ed.): Prentice-Hall, Inc. Upper Saddle River, NJ, USA.
- Hebert, J. R., Ma, Y., Clemow, L., Ockene, I.S., Saperia, G., Stanek III, E. J. et al. (1997). Gender differences in social desirability and social approval bias in dietary self-report. *American Journal of Epidemiology*, 146 (12), 1046-1055.
- Hearst, N., & Chen, S. (2004). Condom promotion for AIDS prevention in the developing world: Is it working? *Studies in Family Planning*, 35 (1):39-47.
- Hesketh, T., Zhang, J., & Qiang, D. J. (2005). HIV knowledge and risk behavior of female sex workers in Yunnan Province, China: potential as bridging groups to the general population. *AIDS Care*, 17 (8), 958-966.
- Hernandez, A. M., Zule, W. A., Karg, R. S., Browne, F. A., & Wechsberg, W. M. (2012). Factors that influence female immigrants and their implications for HIV prevention interventions. *International Journal of Family Medicine*, 2012, ID 876381. doi:10.1155/2012/876381.

- Choi, K. H., Han, C. S., Hudes, E. S., & Kegeles, S. (2002). Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men. *AIDS Education Prevention, 14*(6), 472-481.
- Hooper, D., Coughlan, J., & Mullen, M.R. (2008) Structural equation modeling: guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1) 53-60.
- Hu, L.T., & Benter, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Iacobucci, D. (2010). Structural equation modeling: fit indices, sample size, and advanced topics. *Journal of Consumer Psychology, 20*, 90-98.
- Ibanez, G.E., Marin, B.V.O., Villareal, C., & Gomez, C.A. (2005). Condom use at last sex among unmarried Latino men: an event level analysis. *AIDS and Behavior, 9* (4), 433-441.
- Ibrahim, N., Rampal, L., Jamil, Z., & Zain, A.M. (2012). Effectiveness of peer-led education on knowledge, attitude and risk behavior practices related to HIV among students at a Malaysian public university — a randomized controlled trial. *Preventive Medicine, 55*(5), 505-510.
- Institute of Medicine (2002). Speaking of health: assessing health communication strategies for diverse populations. Committee for behavior change in the 21st Century: improving the health of diverse populations, Board on Neuroscience and Behavioral Health. Retrieved January 24, 2012 from, <http://www.nap.edu/catalog/10018.html>.
- Jama, H., Grillner, L., Biberfeld, G., Osman, S., Isse, S., Abdirahman, M., et al. (1987). Sexually transmitted viral infections in various population groups in Mogadishu, Somalia. *Genitourinary Medicine, 63*, 329-332.
- Jemmott, J. B., Heeren, G. A., Ngwane, Z., Hewitt, N., Jemmott, L. S., Shell, R. et al. (2007). Theory of planned behavior predictors of intention to use condoms among Xhosa adolescents in South Africa. *AIDS Care, 19* (5), 677-684.
- Johnson, A. S., Hu, X., & Dean, H. D. (2010). Epidemiologic differences between native-born and foreign-born Black people diagnosed with HIV infection in 33 U. S. states, 2001-2007. *Public Health Reports, 4* (125), 61-69.
- Joint United Nations Program on HIV/AIDS [UNAIDS] /World Health Organization[WHO] (1998). The male latex condom: 10 condom programming fact sheets. Retrieved July 21, 2012 from http://data.unaids.org/publications/IRC-pub01/jc003-malecondom-factsheets_en.pdf.

- Joint United Nations Program on HIV/AIDS [UNAIDS] (2008). Epidemiological Fact Sheet on HIV and AIDS: Core data on epidemiology and response: Ethiopia. Retrieved July 19, 2012 from http://apps.who.int/globalatlas/predefinedReports/EFS2008/full/EFS2008_ET.pdf.
- Joint United Nations Program on HIV/AIDS [UNAIDS] (2008). Report on the global AIDS epidemic. Executive summary. Retrieved September 19, 2012 from, http://data.unaids.org/pub/GlobalReport/2008/jc1511_gr08_executivesummary_en.pdf.
- Joint United Nations Program on HIV/AIDS [UNAIDS], World Health Organization[WHO], & United Nations Children's Fund [UNICEF], (2008). Epidemiological fact sheet on HIV and AIDS: core data on epidemiology and response. Somalia 2008 Update. Retrieved September 15, 2011 from, http://apps.who.int/globalatlas/predefinedReports/EFS2008/full/EFS2008_SO.pdf
- Joint United Nations Program on HIV/AIDS [UNAIDS] (2009). Annual report 2009. Retrieved November 9, 2012 from http://data.unaids.org/pub/Report/2010/2009_annual_report_en.pdf.
- Joint United Nations Program on HIV/AIDS [UNAIDS] (2010). AIDS epidemic update 2009. Retrieved September 19, 2012 from http://www.unaids.org/documents/20101123_GlobalReport_Chap2_em.pdf.
- Kandula, N.R., Kersey, M., Lurie, N. (2004). Assuring the health of immigrants: what the leading health indicators tell us. *Annual Review of Public Health*, 25, 357-76.
- Kerani, R. P., Kent, J. B., Sides, T., Dennis, G., Ibrahim, A. R., Cross, H., et al (2008). HIV among African-born persons in the United States: a hidden epidemic? *Journal of Acquired Immune Deficiency Syndromes*, 49(1), 102-106.
- Khaliq, M. (2004). Community response to HIV/AIDS: Focus groups with Somali community members. Distinctive Leader Options, Inc., & Minnesota International Health Volunteers. Retrieved November 28, 2012 from, <http://www.wellshareinternational.org/sites/default/files/HIV%20AIDS%20Report%20on%20the%20Somali%20Community.pdf>.
- Kline, R. B. (2005). *Principles and practices of structural equation modeling*. New York: Guilford.
- Kloos, H. & Mariam, D.H. (2000). HIV/AIDS in Ethiopia: an overview. *North East-African Studies*, 7, 13-40.
- Knipper, E., Rhodes, S. D., Lindstrom, K., Bloom, F. R., Leichliter, J. S., & Montano, J. (2007). Condom use among heterosexual immigrant Latino men in the southern United States. *AIDS Education and Prevention*, 19 (5), 436-447.

- Koneru, V. K., Mamani, A.G., Flynn, P. M., & Betancourt, H. (2007). Acculturation and mental health: current findings for future research. *Applied and Preventive Psychology, 12*, 76-96.
- Koya, D. L. & Egede, L. E. (2007). Association between length of residence and cardiovascular disease risk factors among an ethnically diverse group of United States immigrants. *Society of General Internal Medicine, 22*, 841-846.
- Lagarde, E., Carael, M., Glynn, J. R., Kanhonou, L., Abega, S., Kahindo, M., et al. (2001). Educational level is associated with condom use within non-spousal partnerships in four cities of sub-Saharan Africa. *AIDS, 15*, 1399-1408.
- Lagarde, E., Vander Loeff, M. Enel, C., Holmgren, B, Dray-Spra, R. Pison, G. et al. (2003). Mobility and the spread of human immunodeficiency virus into rural areas of West Africa. *International Journal of Epidemiology, 32*, 753-754.
- Lara, M., Gamboa, C., Kahramanian, M. I., Morales, L. S., & Bautista, D. E. (2005). Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. *Annual Review of Public Health, 26*, 367-397.
- Lassetter, H. J., & Callister, C. L. (2009). The impact of migration on the health of voluntary migrants in Western societies. *Journal of Nursing, 20 (1)*, 93-104.
- Lazarus, J. V., Himedan, H.M., Ostergaard, L.R., & Liljestrød, J. (2006). HIV/AIDS knowledge and condom use among Somali and Sudanese immigrants in Denmark. *Scandinavian Journal of Public Health, 34*, 92-99.
- Lemoh, C., Biggs, B., & Hellard, M. (2008). Working with West African migrant communities on HIV prevention in Australia. *Sexual Health, 5*, 313-314.
- Li, A., & Bagger, J. (2007). The balanced inventory of desirable responding (BIDR): a reliability generalization study. *Educational and Psychological Measurement, 67(3)*, 525-544.
- Library of Congress (2005). Country profile: Ethiopia. Retrieved February 23, 2012 from, <http://lcweb2.loc.gov/frd/cs/profiles/Ethiopia.pdf>.
- Lin, P., Simoni, J. M., & Zemon, V. (2005). The health belief model, sexual behaviors, and HIV risk among Taiwanese immigrants. *AIDS Education and Prevention, 17 (5)*, 469-483.
- Lugoe, W., & Rise, J. (1999). Predicting intended condom use among Tanzanian students using the theory of planned behavior. *Journal of Health Psychology, 4 (4)*, 497-506.
- Lutsey, P. L., Roux, A. V., Jacobs, D. R., Burke, L. G., Harman, J., Shea, S, & Folsom, A. R. (2008). Associations of acculturations and socioeconomic status with subclinical

- cardiovascular disease in the multi-ethnic study of atherosclerosis. *American Journal of Public Health*, 98(11), 1963-1970.
- Magis-Rodriguez, C., Lemp, G., Hernandez, M.T., Sanchez, M.A., Estrada, F., & Bravo-Garcia, E. (2009). Going North: Mexican migrants and their vulnerability to HIV. *Journal of Acquired Immune Deficiency Syndromes*, 51, S21–S25.
- Majumdar, B., & Roberts, J. (1998). AIDS awareness among women: the benefit of culturally sensitive educational programs. *Health Care for Women International*, 19, 141-153
- Maharaj, P., & Cleland, J. (2004). Condom use within marital and co-habiting partnerships in KwaZulu-Natal-Natal, South Africa. *Studies in Family Planning*, 35(2), 116-124.
- Maharaj, P. (2005). Patterns of condom use: perspectives of men in Kwazulu-Natal, South Africa. *Development Southern Africa*, 22 (2), 187-197.
- Mahat, G., Scoloveno, M. A., Ayres, C. (2011). HIV/AIDS knowledge and self-efficacy among Nepalese adolescents: a peer education program. *Research and Theory for Nursing Practice: An International Journal*, 25(4), 271-83.
- Makiwane, M., & Mokomane, Z. (2010). South Africa youth's higher-risk sexual behavior: an eco-developmental analysis. *African Journal of AIDS Research*, 9 (1), 17-24.
- Marin, B.V., Gomez, C.A., & Tschann, J. M. (1993). Condom use among Hispanic men with secondary female sexual partners. *Public Health Reports*, 108 (6), 742-750.
- Marin, B.V., Tschann, J.M., Gomez, C.A., & Kegeles, S.M. (1993). Acculturation and gender differences in sexual attitudes and behaviors: Hispanic vs non-Hispanic white unmarried adults. *American Journal of Public Health*, 83 (12), 1759-1761.
- Marín, G., Sabogal, F., VanOss Marín, B., Otero-Sabogal, F., Pérez-Stable, E. J. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences*, 9, 183-205.
- Menon, G., Raghuram, P., & Agrawal, N. (n. d.). Health risk perceptions and consumer psychology. Retrieved December 28, 2012 from, <http://pages.stern.nyu.edu/~gmenon/Menon%20Raghuram%20Agrawal.pdf>.
- Migration Policy Institute (n .d.). Minnesota: Social and demographic characteristics. Retrieved February 3, 2013 from <http://www.migrationinformation.org/datahub/state.cfm?id=mn>.
- Ministry of Health (2007). Single point HIV prevalence estimate. National Consensus Meeting on single HIV prevalence estimation. Palace Hotel, Addis Ababa, Ethiopia, 11-12 May, 2007. Retrieved October 15, 2012 from, http://www.etharc.org/aidsineth/publications/singlepointprev_2007.pdf.

Minnesota Department of Health (n. d.). HIV/AIDS surveillance. Retrieved November 9, 2012 from, <http://www.health.state.mn.us/divs/idepc/diseases/hiv/hivstatistics.html>.

Minnesota Department of Health (2010). Companion text for the Minnesota HIV/AIDS prevalence & mortality report, 2010 slide set. Retrieved October 9, 2012 from, <http://www.health.state.mn.us/divs/idepc/diseases/hiv/stats/pmttext2010.pdf>.

Minnesota Department of Employment and Economic Development (2013). State and national employment and unemployment. Retrieved March 2, 2013 from http://www.positivelyminnesota.com/Data_Publications/Data/Current_Economic_Highlights/State_National_Employment_Unemployment.aspx.

:

Mishra, V., Agrawal, P., Alva, S., Gu, Y., & Wang, S. (2009). Changes in HIV-related knowledge and behaviors in sub-Saharan Africa. DHS Comparative Report No. 24. USAID. ICF Marco. Calverton, Maryland, U.S.A. Retrieved November 28, 2012 from http://pdf.usaid.gov/pdf_docs/PNADQ637.pdf.

Montano, D.E., & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz, B.K. Rimer, & K. Viswanath (Eds.). *Health behavior and Health education; theory, research and practice* (pp. 67-92). San Francisco: Jossey-Bass.

Molla, M., Astrom, A. N., & Brehane, Y. (2007). Applicability of the theory of planned behavior to intended and self-reported condom use in a rural Ethiopian population. *AIDS Care*, 19(3), 425-431.

Mulla, Z. D., Seo, B., Kalameham, R., & Nuwayhid, B.S. (2009). Multiple imputation for missing laboratory data: an example from infectious disease epidemiology. *Annals of Epidemiology*, 19, 908-914.

Muula, A.S. (2010). Marriage, not religion is associated with HIV infection among women in rural Malawi. *AIDS Behavior*, 14(1), 125-131.

Muula, A. S., Thomas, J. C., Pettifor A. E., Strauss R. P, Suchindran C. M., & Meshnick S. R. (2011). Religion, condom use acceptability and use within marriage among rural women in Malawi. *World Health Population*, 12 (4), 35-47.

Muthen, L.K., & Muthen, B. O. (1998-2012). *Mplus User's Guide*. Seventh Edition. Los Angeles, CA: Muthen & Muthen.

Myers, R., Chou, C., Sussman, S., Garbanati, L., Pachon, H., Valente, T. W. (2009). Acculturation and substance use: social influence as a mediator among Hispanic alternative school youth. *Journal of Health and Social Behavior*, 50, 164-179.

- Myers, T. A. (2011). Goodbye, listwise deletion: presenting hot deck imputation as an easy and effective for handling missing data. *Communication Methods and Measures*, 5(4), 297-310.
- Nur, Y.A., Goren, J., Elmi, A. M., Ott, A., & Osterhaus, D.M. (2000). Prevalence of serum antibodies against bloodborne and sexually transmitted agents in selected groups in Somalia. *Epidemiology and Infection*, 124, 137-141.
- Norman, P. (2011). The theory of planned behavior and binge drinking among undergraduate students: assessing the impact of habit strength. *Addictive Behaviors*, 36, 502-507.
- Omorodion, F., Gbadebo, K., & Ishak, P. (2007). HIV vulnerability and sexual risk among African youth in Windsor, Canada. *Culture, Health & Sexuality*, 9 (4), 429-437.
- Paulhus, D. L. (1988). *Assessing self-deception and impression management in self-reports: the Balanced Inventory of Desirable Responding*. Unpublished Manual. Vancouver, Canada: University of British Columbia.
- Pavlish, C. L., Noor, S., & Brandt, J. (2010). Somali immigrant women and the American health care system: discordant beliefs, divergent expectations, and silent worries. *Social Science & Medicine*, 71, 353-361.
- Ping, R.A. (2005). "What is the average variance extracted for a latent variable interaction (or quadratic)?" [on-line paper]. Retrieved February 1, 2013 from <http://home.att.net/~rpjngjr/ave1.doc>.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N.B. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88 (2), 879-903.
- Public Broadcasting Service [PBS] News Hour (2008, August 25). Somalia's struggle for stability: A brief history. Retrieved March 2, 2012 from, http://www.pbs.org/newshour/indepth_coverage/africa/somalia/timeline/index.html.
- Prejean, J., Song, R., Hernandez, A., Ziebell, R., Green, T., Walker, F., et al. (2011). Estimated HIV incidence in the United States, 2006-2009. *PLoS ONE*, 6(8): e17502. doi:10.1371/journal.pone.0017502.
- Protogerou, C., & Turner-Cobb, J. (2011). Predictors of non-condom use intentions by university students in Britain and Greece: the impact of attitudes, time perspective, relationship status, and habit. *Journal of Child and Adolescent Mental Health*, 23 (2), 91-106.
- Raykov, T., & Marcoulides, G. (2006). *A first course in structural equation modeling*. 2nd ed. New Jersey: Lawrence Erlbaum Associate, Inc.

- Reinecke, J., Schmidt, P., & Ajzen, I. (1996). Application of the theory of planned behavior to adolescents' condom use: a panel study. *Journal of Applied Social Psychology*, 26, 749-772.
- Remington, N. (2008). African immigrants in Minnesota Institute for Agriculture and Trade Policy. Retrieved March 1, 2013 from http://www.iatp.org/files/258_2_104335.pdf.
- Rhodes, S. D., Bischoff, W. E., Burnell, J. M., Whalley, L. E., Walkup, M. P., Vallejos, Q. M. et al. (2010). HIV and sexually transmitted disease risk among male Hispanic/Latino migrant farm workers in the Southeast: findings from a pilot CBPR study. *American Journal of Industrial Medicine*, 53 (10), 976-983.
- Robertson, A. A., Stein, J. A., & Baird-Thomas, C. (2006). Gender differences in the prediction of condom use among incarcerated juvenile offenders: testing the information-motivation-behavioral skills (IMB) model. *Journal of Adolescent Health*, 38, 18-25.
- Ronningen, B. J. (2000). Immigrants in Minnesota: an increasingly diverse population. Retrieved November 28, 2012 from, <http://www.demography.state.mn.us/documents/ImmigrationDiverse.pdf>.
- Ronningen, B. J. (2004). Estimates of selected immigrant populations in Minnesota: 2004. Retrieved November 12, 2012 from, <http://www.demography.state.mn.us/PopNotes/EvaluatingEstimates.pdf>.
- Ronningen, B. J. (2006). Demography of immigrants in Minnesota: PowerPoint presentation. July 19, 2006. State Demographic Center. Retrieved March 9, 2012 from, http://www.powershow.com/view/198fff-ZTk5Y/Demography_of_Immigrants_in_Minnesota_flash_ppt_presentation.
- Rosenthal, L., Scott, D. P., Kellela, Z., Zikarge, A., Momoh, M., Lahai-Momoh, Ross, M. W., et al. (2003). Assessing the HIV/AIDS health services needs of African immigrants to Houston. *AIDS Education and Prevention*, 15 (6), 570-580.
- Rubin, D. B. (1987) *Multiple Imputation for Nonresponse in Surveys*. New York: Wiley.
- Salabarria-Pena, Y., Lee, J. W., Montgomery, S. B., Hopp, H.W., & Muralles, A. A. (2003). Determinants of female and male condom use among immigrant women of Central American descent. *AIDS and Behavior*, 7 (2), 163-174.
- Salant, T., & Lauderdale, D.S. (2003). Measuring culture: a critical review of acculturation and health in Asian immigrant populations. *Social Science & Medicine*, 57, 71-90.
- Santelli, J. S., Abraido-Lanza, & Melnikas, A. J. (2009). Migration, acculturation, and sexual reproductive health of Latino adolescents. *Journal of Adolescent Health*, 44, 3-4.

- Schaalma, H., Aaro, L. E., Flisher, A. J., Matthews, C., Kaaya, S., Onya, H. et al. (2009). Correlates of intention to use condoms among sub-Saharan African youth: The applicability of the theory of planned behavior. *Scandinavian Journal of Public Health*, 39 (Suppl. 2), 87-91.
- Scott-Sheldon, L. J., Huedo-Medina, T.B., Warren, M. R., Johnson, B.T., & Carey, M. P. (2011). Efficacy of behavioral interventions to increase condom use and reduce sexually transmitted infections: a meta-analysis, 1991 to 2010. *Acquired Immune Deficiency Syndrome*, 5, 58 (5), 489-498.
- Schafer, J.L. (1999) *NORM users' guide (Version 2)*. University Park. The Methodology Center, Penn State. Retrieved February 1, 2013 from <http://methodology.psu.edu>.
- Sheeran, P. (2002). Intention-behavior relations: a conceptual and empirical review. *European Review of Social Psychology*, 12 (1), 1-36.
- Sheeran, P., Abraham, C., & Orbell, S. (1999). Psychosocial correlates of heterosexual condom use: a meta-analysis. *Psychological Bulletin*, 125 (1), 90-132.
- Sheppard, B. H., Hartwick, J., & Warshaw, P.R. (1988). The theory of reasoned action: a meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research*, 15, 325-343.
- Shi, L., Lebrun, L. A., & Tsai, J. (2009). The influence of English proficiency on access to care. *Ethnicity & Health*, 14 (6), 625-642.
- Sloane, B.C., & Zimmer, C. G. (1993). The power of peer health education. *Journal of American College Health*, 41, 241-245.
- Soskolne, V., & Shtarkshall, R. A. (2002). Migration and HIV prevention programs: linking structural factors, culture, and individual behavior—an Israeli experience. *Social Science & Medicine*, 55, 1297-1307.
- Statistics Calculators. A-priori Sample Size Calculator for Hierarchical Multiple Regression. Statistics Calculator Version 3.0. Retrieved Jan 5, 2012 from <http://www.danielsoper.com/statcalc3/calc.aspx?id=16>.
- Steffen, P. R., Smith, T. B., Larson, M., & Butler, L. (2006). Acculturation to western society as a risk factor for high blood pressure: a meta-analytic review: *Psychosomatic Medicine*, 68, 386-397.
- Stulhofer, A., Graham, C., Bozicevic, I., Kurfrin, K., & Ajdukovic, D. (2007). HIV/AIDS-related knowledge, attitudes, and sexual behaviors as predictors of condom use among young adults in Croatia. *International Family Planning Perspectives*, 33(2), 58-65.

- Sunmola, A.M. (2005). Sexual practices, barriers to condom use and its consistent use among long distance truck drivers in Nigeria. *AIDS Care*, 17(2), 208-221.
- Sutton, S., McVey, D., & Glanz, A. (1999). A comparative test of the theory of reasoned action and the theory of planned behavior in the prediction of condom use intentions in a national sample of English young people. *Health Psychology*, 18 (1), 72-81.
- Sutton, S., French, P.D., Hennings, S.J., Mitchell, J., Wareham, N.J., Griffin, S. et al. (2004). Eliciting salient beliefs in research on the theory of planned behavior: The effect of question wording. In C.J. Armitage & J. Christian (Eds.). *Planned behavior: The relationship between human thoughts and action*. New Brunswick, New Jersey: Transaction Publisher.
- Swenson, R. R., Rizzo, C.J., Brown, L.K., Venable, P.A., Carey, M. P., Valois, R. et al. (2010). HIV knowledge and its contribution to sexual health behaviors of low-income African adolescents. *Journal of the National Medical Association*, 102 (12), 1173-1182.
- Sayles, J. N., Pettifor, A., Wong, M. D., MacPhail, C, Lee, S., Hendriksen, E. et al. (2006). Factors associated with self-efficacy for condom use and sexual negotiation among South African youth. *Journal of Acquired Immune Deficiency Syndrome*, 43 (2), 226-233.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics*. 5th ed. Boston: Allyn and Bacon.
- The Advocates for Human Rights (2006). The facts: Immigration in Minnesota. Retrieved December 6, 2012 from, http://www.energyofanation.org/sites/25e1f498-741c-478a-8a08-aa486d8533a5/uploads/immigration_in_minnesota.pdf.
- The FreeDictionary (2011). Definition of immigrant. Retrieved November 30, 2012 from, <http://www.thefreedictionary.com/immigrant>.
- The Minneapolis Foundation (2004). Immigration in Minnesota: Discovering common ground. Retrieved December 1st 2012 from, <http://www.minneapolisfoundation.org/uploads/CuteEditor/Publications/Community/ImmigrationBrochure.pdf>.
- Tompkins, M., Smith, L., Jones, K., & Swindells, S. (2006). HIV education needs among Sudanese immigrants and refugees in the Midwestern States. *AIDS and Behavior*, 10(3), 319-323. <http://www.springerlink.com/content/7313308918621000/> doi: 10.1007/s10461-005-9060-8.
- Trafimow, D. (2000). Habit as both a direct cause of intention to use a condom and as a moderator of the attitude-intention and subjective norm-intention relations. *Psychology of Health*, 15, 383-393.

- Triandis, H. C. (1977). *Interpersonal behavior*. Monterey, CA: Brooks-Cole
- Trinitapoli, J. (2009). Religious teachings and influences on the ABCs of HIV prevention in Malawi. *Social Science and Medicine*, 69(2), 199-209.
- Unger, J. B., & Molina, G. B. (2000). Acculturation and attitude about contraceptive use among Latina women. *Health Care for Women International*, 21, 235-249.
- UN Interagency Group on Young People's Health (2003). Peer education: Training of the trainers manual. Retrieved March 2, 2013 from http://cfsc.trunky.net/_uploads/Publications/160.peer_education_training_of_trainers.pdf.
- United Nations (2008). Convention related to the status of refugees Geneva, July 28, 1951 and protocol relating to the status of refugees, New York January 31, 1967. Retrieved March 15, 2013 from, <http://untreaty.un.org/cod/avl/ha/prsr/prsr.html>.
- United Nations (2008). Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables). Retrieved December 2nd 2012 from, <http://data.un.org/Data.aspx?q=ethiopia&d=PopDiv&f=variableID%3a12%3bcrID%3a231#PopDiv>.
- United Nations Data (2011). Country profile: Somalia. Retrieved September 15, 2012 from <http://data.un.org/CountryProfile.aspx?crName=Somalia>.
- United Nations Development Program [UNDP] (2010). The international human development indicator. Retrieved September 30, 2012 from <http://hdrstats.undp.org/en/countries/profiles/ETH.html>.
- United Nations General Assembly Special Session [UNGASS] (2008). Country Progress report 2008 on HIV/AIDS. Retrieved October 25, 2012 from http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportssubmittedbycountries/2008progressreportssubmittedbycountries/somalia_2008_country_progress_report_en.pdf.
- United Nations General Assembly Special Session [UNGASS] (2010). Country Progress report 2010 on HIV/AIDS. Retrieved October 25, 2012 from, http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportssubmittedbycountries/somalia_2010_country_progress_report_en.pdf.
- United States Census Bureau (2010). Place of birth of the foreign-born population: 2009. American Community Survey Briefs, U.S. Department of Commerce. Economics and Statistics Administration. Retrieved November 26, 2012 from <http://www.census.gov/prod/2010pubs/acsbr09-15.pdf>.

- United States State Department (2011). Background note: Ethiopia. Retrieved February 29, 2012 from <http://www.state.gov/r/pa/ei/bgn/2859.htm>.
- United States Census Bureau (2013). State & County QuickFacts. Retrieved March 12, 2013 from <http://quickfacts.census.gov/qfd/states/27/2739878.html>.
- Van den Broeck, J., Cunningham, S. R., Eeckels, R. & Herbst, K. (2005). Data cleaning: detecting, diagnosing, and editing data abnormalities. *PLoS Medicine*, 2, e267. www.plosmedicine.org. doi: 10.1371/journal.pmed.0020267.
- Verplanken, B., & Orbell, S., 2003. Reflections on past behavior: a self-report index of habit strength. *Journal of Applied Social Psychology*, 33 (6), 1313-1330.
- Von Haeften, Fishbein, M., Kasprzyk, D., & Montano, D. (2001). Analyzing data to obtain information to design targeted interventions. *Psychology, Health, & Medicine*, 6(2), 151-164.
- Von Haeften & Kensi, K. (2001). Multi-partnered heterosexuals' condom use for vaginal sex with their main partner as a function of attitude, subjective norm, partner norm, perceived behavioral control and weighted control beliefs. *Psychology, Health & Medicine*, 6(2), 166-177.
- Wang, J., Jiang, B., Siegal, H., Falck, R., & Carlson, R. (2001). Level of AIDS and HIV knowledge and sexual practices among sexually transmitted disease patients in China. *Sexually Transmitted Diseases*, 28 (3), 171-175.
- Warren, M., & Philpott, A. (2003). Expanding safer sex options: introducing the female condom into national programs. *Reproductive Health Matters*, 11, 21, 130-139.
- Washington State Department of Health (2010). HIV among foreign-born Blacks. Retrieved November 30, 2012 from <http://www.doh.wa.gov/cfh/hiv/statistics/docs/fs12-10fb.pdf>.
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? a meta-Analysis of the experimental evidence. *Psychological Bulletin*, 132 (2), 249-268.
- Weston, R., Chan, F., Gore, P.A., & Catalano, D. (2008). An introduction to using structural equation models in rehabilitation psychology. *Rehabilitation Psychology*, 53 (3), 340-356.
- Williams, C. (2011, Associated Press October 27). New census data: Minnesota Somali populations grow. Retrieved November 19, 2012 from, <http://www.startribune.com/local/132670583.html>.

- Ybarra, M. L., Korchmaros, J., Kiwanuka, J., Bangsberg, D. R., & Bull, S. (2013). Examining the applicability of the IMB model in predicting condom use among sexually active secondary school students in Mbarara, Uganda. *AIDS Behavior, 17*, 1116-1128.
- Zellner, S. L. (2003). Condom use and the accuracy of AIDS knowledge in Cote d'Ivoire. *International Family Planning Perspectives, 29* (1), 41-47.

APPENDIX A: ELICITATION QUESTIONNAIRE

Site: _____

Gender: _____ M/F

Age: _____

Years of formal education: _____

Place of birth: _____

Years lived in the U.S.: _____

1. Affective Attitude:

a. What do you like about using condom with your steady partner? (e. g., sex with condom feels good)

b. What do you dislike about using condom with your steady partner?

(e. g. sex is unnatural, condoms ruin the mood, break the rhythm, using condoms means you're promiscuous, against my religion).

2. Instrumental Attitude

a. What are advantages of using condom with your steady partner? (e.g., avoid pregnancy, avoid sexually transmitted diseases)

b. What are disadvantages of using condom with your steady partner? (Can't have children, embarrassing, partner thinks you're diseased).

3. Normative Influence

a. Are there individuals or groups who would support you using a condom with your steady partner? Can you list each of them? (e. g. health care professionals, doctors brothers, sisters, friends, parents, partners, etc.).

b. Are there individuals or groups who would be against you using a condom with your steady partner? Can you list each of them?

4. Perceived Behavioral Control

- a. What makes it easy for you to use condoms with your steady partner? (e. g., easy to carry in pocket, lives close to store, inexpensive).
- b. What makes it hard for you use condoms with your steady partner?
(e.g., expensive, trouble to carry condoms, don't know where to find one)

5. Self-efficacy

- a. What would help you overcome any barriers to use condom with your steady partner?
(e.g., talking to my partner; knowing how to us it, partner support.).
- b. What would enable you use condom with your steady partner?
(e.g., planning before having sex, partner approval,)

APPENDIX B: SURVEY QUESTIONNAIRE

RESEARCH OBJECTIVE

To examine the determinants of condom use among East-African immigrants

DEFINITION: Steady partnership is defined as relationship that is regular and between (married, unmarried, girlfriend/boyfriend, or cohabiting) partners excluding casual encounters.

HOW TO FILL THE QUESTIONNAIRE

- Think about how you feel about using a condom **each time** you have sex with **your steady partner in the next month.**
- Make sure you haven't missed any questions.
- Answer each question by circling one of the choices that best reflects your opinion.
- Please do not circle more than one number on a single question.
- There are no right or wrong answers.
- Your responses are completely anonymous and will remain confidential.

THANK YOU VERY MUCH

SECTION I. SHORT ACCULTURATION SCALE

In this section, you are going to answer about the language you prefer to speak and about your friends. Please, mark the number that corresponds to the best answer for each question. There are no right or wrong answers to these questions.

	Only Somali/ Oromo/ Amharic	More Somali/ Oromo/ Amharic	Both Equally	More English than Somali/ Oromo/Amharic	Only English
1. In general, what language (s) do you read and speak?	1	2	3	4	5
2. What was the language(s) you used as a child?	1	2	3	4	5
3. What language(s) do you usually speak at home?	1	2	3	4	5
4. In which language(s) do you usually think?	1	2	3	4	5
5. In what language(s) do you usually speak with your friends?	1	2	3	4	5
6. In what language(s) are the TV programs you usually watch?	1	2	3	4	5
7. In what language(s) are the radio programs you usually listen to?	1	2	3	4	5
8. In general, in what language(s) are the movies, or TV and radio programs you prefer to watch and listen?	1	2	3	4	5
	All Somalis/Ethio pians	More Somalis/Ethiopians than Anglo	About half and half	More Anglo than Somalis/Ethiopians	All Anglos
9. Your close friends are	1	2	3	4	5
10. You prefer going to social gathering/parties at which the people are	1	2	3	4	5
11. The person you visit or who you visit are	1	2	3	4	5
12. If you could choose your children's friends, you would want them to be:	1	2	3	4	5

SECTION II

ATTITUDE TO CONDOMS-DIRECT MEASUREMENT

Please choose and circle a number that represents your opinion about condom use (1= very harmful, 2= harmful, 3= neither harmful nor beneficial, 4= beneficial, 5= very beneficial).

1. If I have sex, using a condom each time would be

Harmful	1	2	3	4	5	Beneficial
---------	---	---	---	---	---	------------

Please choose and circle a number that represents your opinion about condom use (1= very good, 2= good, 3= neither good nor bad, 4= bad, 5=very good).

2. If I have sex, using a condom each time would be

Good	1	2	3	4	5	Bad
------	---	---	---	---	---	-----

Please choose and circle a number that represents your opinion about condom use (1= very pleasant, 2=pleasant, 3=neither pleasant nor unpleasant, 4=unpleasant, 5=very unpleasant).

3. If I have sex, using a condom each time would be

Pleasant	1	2	3	4	5	Unpleasant
----------	---	---	---	---	---	------------

Please choose and circle a number that represents your opinion about condom use (1=very useless, 2=useless, 3=neither useless nor useful, 4=useful, 5=very useful).

4. If I have sex, using a condom each time would be

Useless	1	2	3	4	5	Useful
---------	---	---	---	---	---	--------

Please choose and circle a number that represents your opinion about condom use (1=very agreeable, 2= agreeable, 3=neither agreeable nor disagreeable, 4=disagreeable, 5 very disagreeable).

5. If I have sex, using a condom each time would be

Agreeable	1	2	3	4	5	Disagreeable
-----------	---	---	---	---	---	--------------

Please choose and circle a number that represents your opinion about condom use (1=very unsafe, 2= unsafe, 3=neither safe nor unsafe, 4=safe, 5 very safe).

6. If I have sex, using a condom each time would be

Unsafe	1	2	3	4	5	Safe
--------	---	---	---	---	---	------

ATTITUDE-INDIRECT MEASUREMENT

Please choose and circle a number that shows your agreement or disagreement with the statements below (1= strongly disagree, 2= disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
7. If I have sex, using a condom each time would reduce my sexual pleasure.	1	2	3	4	5
8. If I have sex, I would not use a condom each time because it would feel unnatural.	1	2	3	4	5
9. If I have sex, using a condom each time would be against my religious values.	1	2	3	4	5
10. If I have sex, using a condom each time would give me peace-of- mind.	1	2	3	4	5

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
11. If I have sex, using a condom each time would be against my cultural values.	1	2	3	4	5
12. If I have sex, using a condom each time would mean that I have sex with a lot of different people.	1	2	3	4	5
13. If I have sex, using a condom each time would be embarrassing.	1	2	3	4	5
14. If I have sex, using a condom each time would reduce my partner's sexual pleasure.	1	2	3	4	5

OUTCOME EVALUATION (- 2 to + 2)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
15. My reduced sexual pleasure troubles me if I have sex with a condom.	1	2	3	4	5
16. It bothers me to have unnatural feeling if I have sex with a condom.	1	2	3	4	5
17. Using a condom would trouble me because it is against my religious values.	1	2	3	4	5
18. Having peace-of-mind is important to me if I have sex with a condom.	1	2	3	4	5
19. If I have sex, using a condom would trouble me because it is against my cultural values.	1	2	3	4	5
20. The idea that my partner may think I have sex with different people if I use condom troubles me.	1	2	3	4	5
21. The embarrassment I feel if I have sex with a condom troubles me.	1	2	3	4	5
22. My partner's sexual pleasure is important to me if I have sex with a condom	1	2	3	4	5

INSTRUMENTAL ATTITUDE –INDIRECT MEASURE

	Strongly disagree 1	Disagree 2	Neither 3	Agree 4	Strongly agree 5
23. If I have sex, I would use a condom each time to prevent pregnancy.					
24. If I have sex, I would use a condom each time to prevent HIV infection.	1	2	3	4	5
25. If I have sex, I would use a condom each time to protect against other sexually transmitted infections.	1	2	3	4	5
26. If I have sex, I would not use a condom each time because I want to have children.	1	2	3	4	5

OUTCOME EVALUATION (-2 to +2)

	Strongly disagree	Disagree	Neither	Agree	Strongly Agree
27. If I have sex, preventing pregnancy is important to me.	1	2	3	4	5
28. If I have sex, protecting against HIV infection is important to me.	1	2	3	4	5
29. If I have sex, avoiding other sexually transmitted infections is important to me.	1	2	3	4	5
30. If I have sex, it bothers me to use a condom because I cannot have children with my partner.	1	2	3	4	5

DIRECT MEASUREMENT –INJUNCTIVE NORMS

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
31. People important to me would approve if I use a condom each time I have sex.	1	2	3	4	5
32. People important to me think it is a good idea to use a condom each time I have sex.	1	2	3	4	5
33. People important to me would suggest that I use a condom each time I have sex.	1	2	3	4	5

DIRECT MEASUREMENT –DESCRIPTIVE NORMS

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
	1	2	3	4	5
34. People important to me would likely use condoms each time they have sex.					
35. People similar to me think that it is a good idea to use condoms each time during sex.	1	2	3	4	5
36. People important to me would likely make sure to use condoms each time they have sex.	1	2	3	4	5

INDIRECT MEASUREMENT-INJUNCTIVE NORMS (-2 to 2)

	Strongly disagree	Disagree	Neither	Agree	Strongly agree	
	1	2	3	4	5	
37. My doctors or providers think that I should use a condom each time I have sex.						
38. My friends think that I should use a condom each time I have sex.	1	2	3	4	5	
39. My close family members think that I should use a condom each time I have sex.	1	2	3	4	5	
40. My partner thinks that we should use a condom each time we have sex.	1	2	3	4	5	Have no Partner
41. My parents think that I should use a condom each time I have sex.	1	2	3	4	5	

MOTIVATION TO COMPLY

42. I want to do what my doctors/ providers tell me I should do.	1	2	3	4	5	
43. I want to do what my friends think I should do.	1	2	3	4	5	
	Strongly disagree	Disagree	Neither	Agree	Strongly agree	
44. I want to do what my close family members think I should do.	1	2	3	4	5	
45. I want to do what my partner thinks I should do.	1	2	3	4	5	Have no partner
46. I want to do what my parents think I should do.	1	2	3	4	5	

**INDIRECT MEASUREMENT- DESCRIPTIVE
NORMS (-2 to 2)**

	Strongly disagree	Disagree	Neither	Agree	Strongly agree	
47. My friends would likely use a condom each time they have sex.	1	2	3	4	5	
48. My close family members would likely use a condom each time they have sex.	1	2	3	4	5	
49. My partners would likely use a condom each time we have sex.	1	2	3	4	5	Have no partner

MOTIVATION TO COMPLY

50. Doing the same things my friends do is important to me.	1	2	3	4	5	
51. Doing the same things my close family members do is important to me.	1	2	3	4	5	
52. Doing the same things my partners do is important to me.	1	2	3	4	5	Have no partner

**PERCEIVED BEHAVIOURAL CONTROL –
DIRECT MEASUREMENT**

	Strongly disagree	Disagree	Neither	Agree	Strongly agree	
53. If I were to have sex, it would be difficult for me to use a condom because my partner would not want to use one.	1	2	3	4	5	
54. If I were to have sex, it would be difficult for me to use a condom because I would feel embarrassed to buy one.	1	2	3	4	5	

55. If I were to have sex, it would be difficult for me to use a condom because I do not know how to use one.	1	2	3	4	5
---	---	---	---	---	---

56. If I were to have sex, it would be difficult for me to use a condom because it is embarrassing to carry them around in my pocket.	1	2	3	4	5
---	---	---	---	---	---

57. If I were to have sex, it would be difficult for me to use a condom because condoms cost a lot of money.	1	2	3	4	5
--	---	---	---	---	---

58. If I were to have sex, the decision to use a condom is up to me.	1	2	3	4	5
--	---	---	---	---	---

**PERCEIVED BEHAVIOURAL CONTROL –
INDIRECT MEASUREMENT**

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
59. If I have sex, I often cannot use a condom each time because my partner would not want to use one.	1	2	3	4	5

60. If I have sex, I often cannot use a condom each time because I feel embarrassed to buy one.

61. If I have sex, I often cannot use condom each time because I do not know how to use it correctly.	1	2	3	4	5
---	---	---	---	---	---

62. If I have sex, I often cannot use condom each time because I feel embarrassed to carry in my pocket or wallet.	1	2	3	4	5
--	---	---	---	---	---

63. If I have sex, I often cannot use condom each time because buying condoms cost a lot of money.	1	2	3	4	5
--	---	---	---	---	---

PERCEIVED POWER OF CONTROL -2 to +2

	Strongly disagree	disagree	Neither	Agree	Strongly agree
64. If my partner would not want to use a condom, it would be much more difficult for me to use one each time we have sex.	1	2	3	4	5

65. If I feel embarrassed to buy a condom, it would be much more difficult for me to use one each time I have sex.	1	2	3	4	5
66. If I feel that I do not know how to use a condom correctly, I would less likely use one each time I have sex.	1	2	3	4	5
67. If I feel embarrassed to carry a condom around, I would less likely use one each time I have sex.	1	2	3	4	5
68. If condoms cost a lot of money, it would be much more difficult for me to use one each time I have sex.	1	2	3	4	5

SELF-EFFICACY

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
69. If I were to have sex, I am sure that I would talk to my partner to use condom each time we have sex.	1	2	3	4	5
70. If I were to have sex, I am sure that I would encourage my partner to use a condom each time we have sex.	1	2	3	4	5
71. If I were to have sex, I feel confident that I would plan to use a condom each time I have sex.	1	2	3	4	5
72. If I were to have sex, I am confident that I would know how to use a condom each time I have sex.	1	2	3	4	5
73. If I were to have sex, I am confident that my partner would support me to use condom each time we have sex.	1	2	3	4	5

BEHAVIORAL INTENTION

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
74. If I have sex with my partner, I intend to use a condom each time.	1	2	3	4	5
75. If I have sex with my partner, I plan to use a condom each time.	1	2	3	4	5
76. If I have sex with my partner, I want to use a	1	2	3	4	5

condom each time.

PAST BEHAVIOR

77. In the past 12 months I used a condom each time I
had sex with my partner.

1 2 3 4 5

SECTION III: THE BALANCED INVENTORY OF DESIRABLE RESPONDING, BIDR

Circle a number for each statement to indicate how true it is. There are no right or wrong answers.

	1 Not true	2	3	4 Some what	5	6	7 Very true
1. My first impressions of people usually turn out to be right.	1	2	3	4	5	6	7
2. It would be hard for me to break any of my bad habits.	1	2	3	4	5	6	7
3. I don't care to know what other people really think of me.	1	2	3	4	5	6	7
4. I have not always been honest with myself.	1	2	3	4	5	6	7
5. I always know why I like things.	1	2	3	4	5	6	7
6. When my emotions are aroused, it biases my thinking.	1	2	3	4	5	6	7
7. Once I've made up my mind, other people can seldom change my opinion.	1	2	3	4	5	6	7
8. I am not a safe driver when I exceed the speed limit.	1	2	3	4	5	6	7
9. I am fully in control of my own fate.	1	2	3	4	5	6	7
10. It's hard for me to shut off a disturbing thought	1	2	3	4	5	6	7
11. I never regret my decisions	1	2	3	4	5	6	7
12. I sometimes lose out on things because I can't make up my mind soon enough.	1	2	3	4	5	6	7
14. My parents were not always fair when they punished me.	1	2	3	4	5	6	7
15. I am a completely rational person	1	2	3	4	5	6	7
16. I rarely appreciate criticism	1	2	3	4	5	6	7
17. I am very confident of my judgments	1	2	3	4	5	6	7
18. I have sometimes doubted my ability as a lover.	1	2	3	4	5	6	7

Circle a number for each statement to indicate how true it is. There are no right or wrong answers.

	1 Not true	2	3	4 Some what	5	6	7 Very true
19. It is all right with me if some people happen to dislike me.	1	2	3	4	5	6	7
20. I don't always know the reasons why I do the things I do.	1	2	3	4	5	6	7
21. I sometimes tell lies if I have to.	1	2	3	4	5	6	7
22. I never cover up my mistakes	1	2	3	4	5	6	7
23. There have been occasions when I have taken advantage of someone	1	2	3	4	5	6	7
24. I never swear.	1	2	3	4	5	6	7
25. I sometimes try to get even rather than forgive and forget.	1	2	3	4	5	6	7
26. I always obey laws, even if I'm unlikely to get caught.	1	2	3	4	5	6	7
27. I have said something bad about a friend behind his/her back	1	2	3	4	5	6	7
28. When I hear people talking privately, I avoid listening	1	2	3	4	5	6	7
29. I have received too much change from a salesperson without telling him or her.	1	2	3	4	5	6	7
30. I always declare everything at customs.	1	2	3	4	5	6	7
31. When I was young I sometimes stole things.	1	2	3	4	5	6	7
32. I have never dropped litter on the street.	1	2	3	4	5	6	7
33. I sometimes drive faster than the speed limit	1	2	3	4	5	6	7
34. I never read sexy books or magazines.	1	2	3	4	5	6	7
35. I have done things that I don't tell other people about.	1	2	3	4	5	6	7
36. I never take things that don't belong to me.	1	2	3	4	5	6	7

Circle a number for each statement to indicate how true it is. There are no right or wrong answers.

37. I have taken sick-leave from work or school even though I wasn't really sick.	1 Not true	2	3	4 Some what	5	6	7 Very true
38. I have never damaged library book or store merchandise without reporting it.	1	2	3	4	5	6	7
39. I have some pretty awful habits.	1	2	3	4	5	6	7
40. I don't gossip about other people's business.	1	2	3	4	5	6	7

SECTION IV: THE SELF REPORTED HABIT INDEX, SRHI

Please choose and circle a number that represents your opinion about condom use (1= strongly agree 2= agree, 3=neither agree nor disagree, 4=disagree, 5= strongly disagree).

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
1. Using condoms with my steady partner is something I do frequently.	1	2	3	4	5
2. Using condoms with my steady partner is something I do automatically.	1	2	3	4	5
3. Using condoms with my steady partner is something I do without having to consciously remember.	1	2	3	4	5
4. Using condoms with my steady partner is something that makes me feel weird, if I do not do it.	1	2	3	4	5
5. Using condoms with my steady partner is something I do without thinking.	1	2	3	4	5
6. Using condoms with my steady partner is something that would require effort to do it.*	1	2	3	4	5
7. Using condoms with my steady partner is something that belongs to my (daily, weekly, monthly) routine.	1	2	3	4	5
	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree

8. Using condoms with my steady partner is something I start doing it before I realize I am doing it.	1	2	3	4	5
9. Using condoms with my steady partner is something I would find hard not to do it.	1	2	3	4	5
10. Using condoms with my steady partner is something I have no need to think about doing.	1	2	3	4	5
11. Using condoms with my steady partner is something that is typically me.	1	2	3	4	5
12. Using condoms with my steady partner is something I have been doing it for a long time.	1	2	3	4	5

*Modified

SECTION V: QUESTIONS ABOUT YOURSELF

1. Site: _____
2. How old are you? _____ years
3. What is your gender? Male _____ Female _____
4. What is your country of origin? Somalia _____ Ethiopia _____ other (specify) _____
5. What is your marital status? Married _____ Divorced _____ Widowed _____
Separated _____ Single _____
6. What is your educational level?
____ Never attended school
____ Elementary (1-8)
____ Some high school (9-11)
____ High school graduate
____ Some college (1-3)
____ College graduate
7. What is your religious affiliation? Muslim _____ Christian _____ Other _____
8. How long you lived in the U.S.? _____ years _____ months _____



THE UNIVERSITY OF TEXAS AT EL PASO
Office of the Vice President for Research and Sponsored Projects
Institutional Review Board
El Paso, Texas 79968-0587
phone: 915 747-8841 fax: 915 747-5931

FWA No: 00001224

DATE: March 30, 2012

TO: Mahamud Ahmed, M.S.

FROM: University of Texas at El Paso IRB

STUDY TITLE: [318510-1] DETERMINANTS OF CONDOM USE AND HIV PREVENTION
AMONG EAST AFRICAN IMMIGRANTS IN MINNESOTA

IRB REFERENCE #: 318510-1

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: March 30, 2012

Thank you for your submission of New Project materials for this research study. University of Texas at El Paso IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations 45 CFR 46.101 (b) (2).

We will put a copy of this correspondence on file in our office.

Exempt protocols do not need to be renewed. Please note that it is the Principal Investigator's responsibility to resubmit the proposal for review if there are any modifications made to the originally submitted proposal. This review is required in order to determine if "Exemption" status remains.

If you have any questions, please contact Athena Fester at (915) 747-8841 or afester@utep.edu. Please include your study title and reference number in all correspondence with this office.

cc:

CURRICULUM VITAE

Mahamud Ahmed joined the interdisciplinary Health Sciences PhD program at The University of Texas at El Paso in the spring of 2009 and successfully defended his dissertation on April 29, 2013. Mahamud Ahmed received his Bachelor's degree in Biology from Metropolitan University at Paul, Minnesota, in 2005 and earned his Master's degree in Community Health from Minnesota State University, Mankato, in 2008. He is currently a Certified Health Education Specialist. While pursuing his doctoral degree, Mahamud had worked with NIH funded project to reduce the risk of cardiovascular disease in Hispanics along the U.S.-Mexico border through a community based participatory research. Mahamud is a member of local chapter of Society of Public Health Education (SOPHE) and presented his research work in several national public health conferences and published two articles in peer-reviewed journals.