Sexual self-efficacy among adolescent men and women living in an HIV-hyper-endemic setting of South Africa

by

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Abstract

Adolescent women in South Africa face disproportionate HIV acquisition. In this context, evidence remains mixed on whether sexual self-efficacy (SSE)- one's perceived control in decision-making regarding safe sex, predicts consistent condom use (CCU). Using cross-sectional survey data from 830 adolescent men and women aged 14-19 living in Soweto, South Africa, this thesis conducted gender-based analyses to examine determinants of high-SSE (study-alpha=0.75) and the association between high-SSE and CCU. Results revealed women have higher SSE than men. High-SSE was associated with CCU use for men, but not women. For women, high-SSE was associated with having an adult in the home, and no history of physical violence. Moreover, lower depressive symptomology among women was more predictive of CCU than SSE, indicating that gender-targeted HIV prevention interventions must move beyond individual-level determinants of behaviour to address socio-structural and relational factors influencing syndemic HIV risk among adolescent women in South Africa.

Keywords: Adolescents; HIV prevention; Gender; Self-Efficacy; Sexual Decision-Making; Sexuality

Dedication

"After climbing a great hill, one only finds that there are many more hills to climb" - Nelson Mandela

This thesis is dedicated to my grandparents who without I would never have made it this far in my academic endeavours. Thank you for your support, your unending encouragement and for showing me that true love does exist.

Also, to all young people across the globe who's voices are too often ignored in the fight for social justice and gender equality, this work is far from over. Let's keep climbing these hills together.

In loving memory of my grandmother Joan Closson (07.03.17) and my father Lyle Closson (01.06.02).

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List of Acronyms

AIDS	Acquired Immunodeficiency Syndrome
AYA	Adolescents and Young Adults
AIC	Akaike information criterion
BBAHS	Botsha Bophelo Adolescent Health Survey
CCU	Consistent Condom Use
CES-D	Centre for Epidemiological Studies Depression Scale
CUSE	Condom Use Self-Efficacy
DALYs	Disability Adjusted Life Years
HIV	Human Immunodeficiency Virus
KMAC	Kganya Motsha Adolescent Centre
L6M	Last 6 months
PCA	Principle component analysis
PHRU	Perinatal HIV Research Unit
PCBS	Positive Condom Belief Scale
PrEP	Pre-exposure Prophylactic
RDP	Reconstruction development program
SCM	Socio-cognitive model
SLT	Social-learning theory
SRBS	Sexual Relationship Belief Scale Scores
SRH	Sexual Reproductive Health
SRSE	Sexual Refusal Self-Efficacy
SSE	Sexual Self-efficacy
UNFPA	United Nations Population Fund
VCT	Voluntary Counseling and Testing

Preface

This manuscript-based thesis is comprised of five chapters, a few a which are in various stages of publication. As such, the methods and some of the introduction, and discussion within the different chapters are repetitive.

A version of **Chapter 2** is currently under review and has received substantial contributions and revisions from the listed authors below:

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Chapter 1. Background, Rationale, and Objectives

1.1 Abstract

Chapter 1 provides an overview of my thesis. In this chapter I outline: 1) the importance of targeting adolescents and young adults (AYA) in global efforts to improve sexual and reproductive health (SRH) outcomes, including reducing HIV acquisition; 2) the context of HIV in South Africa; 3) the need to focus on AYA in the priority setting of South Africa, and how the epidemic in South Africa is increasingly feminized, particularly among young populations; 4) gender differences in HIV prevention uptake, gaps and barriers, including condom use, in South African AYA; 5) the use of psychosocial determinants of sexual behaviour, such as sexual self-efficacy (SSE), within HIV prevention research; 6) gaps in the literature regarding gendered investigations of SSE and sexual behaviour; and 7) finally, the objectives and hypotheses for my thesis, and the methods used, including the study setting and study design.

1.2 Background

1.2.1 Sexual and reproductive health of adolescent men and women in a global context

The WHO defines adolescence as the age period between 10 and 19 years (1). As of 2009, there were 1.2 billion people aged 10 to 19, the largest generation of adolescents ever, with the vast majority residing within developing countries (2, 3). Adolescence is a formative time, where high incidence of mental health concerns (e.g. depression), substance and sexual initiation, and inconsistent condom use, introduce significant risks of unintended pregnancy, sexually transmitted infections (STIs), and HIV infection (4-6).

Sexual behavioural patterns and health outcomes occurring and being formed during adolescence make this demographic a particularly important target for public health prevention and intervention strategies (4, 7). As such, much research and public health practice has focused on developing appropriate interventions for reducing STI and HIV incidence among key populations of young people globally (8). Between 2001

and 2012, HIV incidence among adolescents and young adults (AYA) (aged 15-24) decreased by 50% or more in 21 countries globally and by 42% in sub-Saharan Africa (9). Despite this significant progress, AIDS remains to be the second leading cause of death, second to road injuries, and fourth cause of disability-adjusted life years (DALYs), among adolescents (aged 10-19), globally, and the number one cause of death among adolescents in sub-Saharan Africa (1, 10). At present an estimated 2.1 million adolescents are living with HIV, among which 62% are women (11).

Beyond HIV, AYA women face disproportionate sexual and reproductive health (SRH) burdens including heightened incidences of STIs (12-15) unwanted pregnancies, miscarriages and complications from pregnancy and unsafe abortions (16-20) that have detrimental implications across the life course. For example, heightened STI acquisition experienced among AYA women has serious implications for overall SRH, as STI acquisition has been shown to dramatically increase likelihood of HIV transmission and acquisition (14, 21). Thus, it imperative that efforts aim to improve the uptake of testing and increased access to treatment for STIs among AYA (14, 21). Given the disproportionate burdens of SRH outcomes that occur during adolescence, increased promotion of positive SRH strategies among AYA is critical for the success of future generations (22).

Negative SRH outcomes (e.g. HIV, STIs, unintended pregnancy and maternal mortality and morbidity) that often occur during adolescence have serious effects across the life course (4) and pose significant implications for future generations. There are, however, many knowledge and program gaps that exist in understanding determinants for health and sexual wellbeing among young people (6, 23). This has been exacerbated by the fact that youth have historically only been seen as recipients of, rather than active participants in HIV and SRH programming (24). Furthermore, within SRH programming and research interventions adolescent sexual rights and agency have been largely ignored (7, 25), particularly among a large body of literature centered on abstinence-based programming (26). This ineffective, and often harmful focus denies adolescents sexual rights and opportunities for healthy and safe sexuality needs to be redressed in order to examine and acknowledge the importance of larger socio-structural determinants (e.g. gender, socio-economic status and relationship dynamics) of HIV and other SRH outcomes (22).

In recent years international organizations have begun to acknowledge the gaps in the SRH health service delivery among AYA by calling for an expansion in youth-friendly and engaged services, supports and research initiatives. According to the United Nations Population Fund (UNFPA) a 'youth-friendly' SRH-care package includes: 1) universal access to accurate SRH information; 2) a range of safe and affordable contraceptive methods; 3) adolescent-friendly and gender-sensitive counselling; 4) quality obstetric and antenatal care for pregnant women and girls; and 5) The prevention and management of sexually transmitted infections, including HIV (27). Youth friendly service delivery seeks to address gaps in the implementation of SRH services for young people who are often lost to care in the transition from childhood to adulthood (28). A youth-friendly approach to care and research acknowledges that in order for policies and programs aimed at addressing the needs of adolescents to be effective, a rights-based approach is needed, where young people are at the centre of the decision-making processes that affect their sexual health and well-being (4, 29, 30).

Research questions undertaking a rights-based approach must begin to examine and question larger socio-structural determinants of SRH outcomes among priority populations of AYA (31, 32). Priority population include AYA residing in HIV hyper-endemic settings, where at least 1% of the population is living with HIV and at least 50% of all people living with HIV are women (33). Thus, in order to critically examine the historical focus on western constructed, individual-level determinants of behaviour change a shift towards rights-based services and research methods that acknowledge gender and age differences within HIV hyper endemic settings within sub-Saharan Africa are of particular importance (29, 34, 35).

1.2.2 Adolescents, gender and HIV in South Africa

South Africa is home to approximately 50 million individuals, with about 30% of the total population being between the ages of 10-24 (36). Heightened incidence and prevalence of HIV within hyper-endemic nations such as South Africa have been influenced by historical legacies of colonialism and apartheid, including institutional racism, and mass wealth and health inequities between white and black South Africans (37, 38). For example, large displacements of young black men from rural to urban mining industries led to limited mobility and few economic opportunities for women in rural areas, increasing economic independence and experiences of intimate sexual and

physical partner violence (38). Migrant working conditions also influenced shifts in sexual norms surrounding multiple-concurrent partnerships and engagement in commercial sex work (39-41). Historical roots of inequities in the distribution of HIV persist into present day, as such South Africa is home to the highest absolute number of people living with HIV in the world (approximately 6 million) (42). Despite, these historical legacies and high-sustained levels of HIV incidence and prevalence in the nation, few studies undertake a rights-based approach which acknowledges and places affected populations most at risk, at the centre of the research process (38).

Among adolescents in South Africa, HIV prevalence accumulates quickly, with rates going from 2.4% in those 0-14 to 3.2% in those aged 15-19, 11.2% among 20-24 year olds, increasing to 22.8% in those 20-24, indicating the dire need for a scale-up of HIV prevention efforts in young populations (1, 37, 43, 44). The HIV epidemic within South Africa is increasingly feminized, with young women disproportionately being infected. In adolescents and young adults aged 15-24, HIV incidence is up to four times higher among women than men (13.3 % vs. 3.8% in 2012) (45). It is estimated that 82% of new infections among adolescents in South Africa occur in women, and that those aged 18-24 years have incidence rates up to three times higher than those over 25 (45).

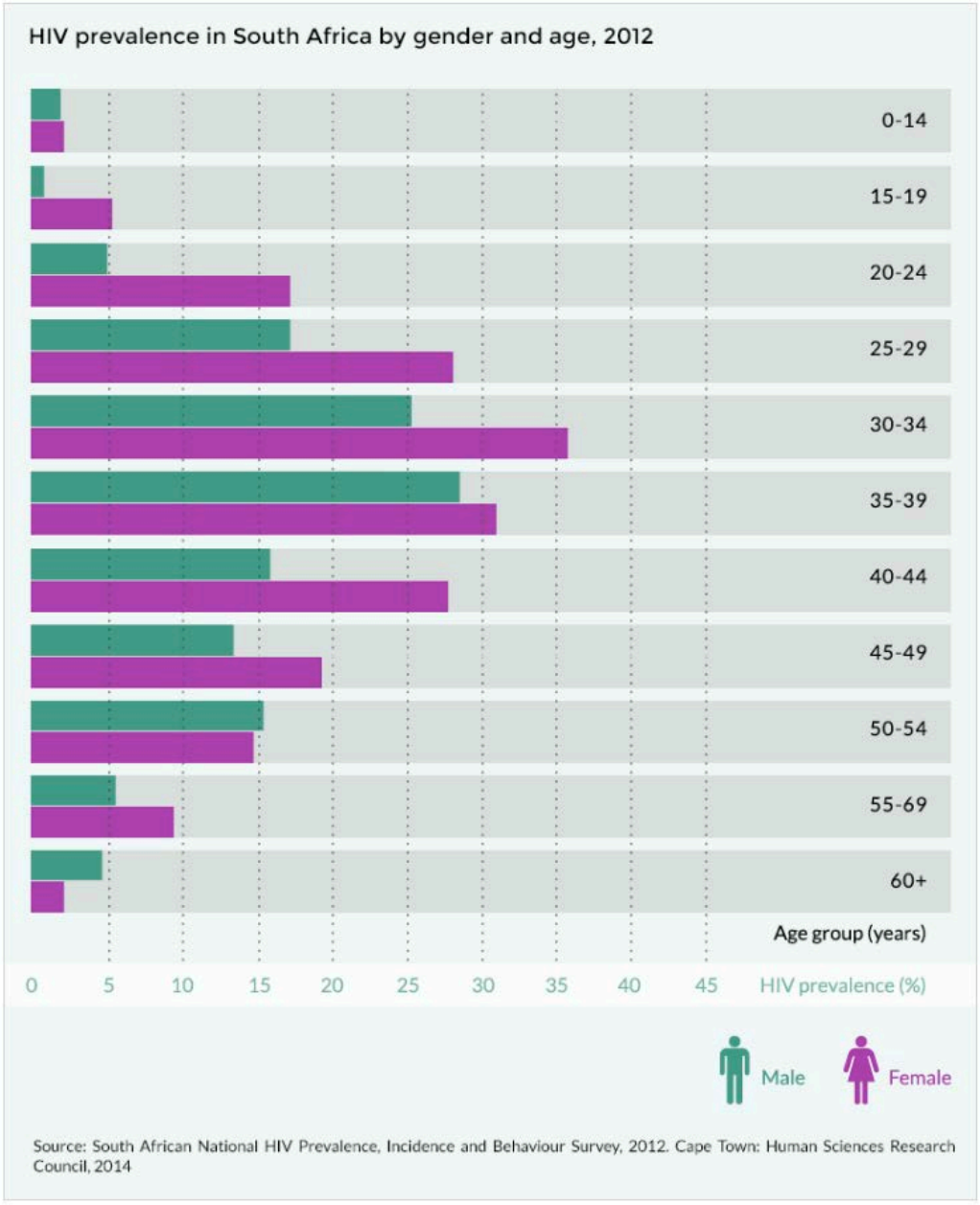

Figure 1-1 **Increasing rates of HIV prevalence in adolescents is highly gendered, with rates nearly tripling for young women in the 15-19 to 20-24 age group category (Human Sciences Research Council, 2014).**

Given the high-sustained levels of HIV prevalence and incidence, researchers have identified numerous individual (e.g. biological, knowledge, beliefs), relational (e.g. communication, relationship power dynamics, partnership types), and structural determinants (e.g. wealth inequity, unemployment, gender-based violence) driving the on-going HIV epidemic for young women.

On an individual level, young women are biologically more susceptible to HIV if engaging in intercourse at an early age, due to the immaturity of the vaginal track, which increases the risk of experiencing tears and rips during sex (46). Also, the vaginal wall has a larger surface area than the penis, which increases the probability of HIV exposure (47). Beyond biology there a number of socio-structural and relational factors that increase young women's susceptibility to HIV transmission.

Structurally, large power imbalances, coupled with mass economic inequalities, high levels of unemployment and food insecurity, often manifests in decreased opportunities and economic dependence and increased levels of alcohol and drug use for young women placing them in inferior roles within their relationships, increasing their likelihood of experiencing gender-based violence, and thus, compromising their ability to make consensual decisions regarding their sexual health (48). Relationally, intergenerational sex is common in South Africa where older men seek younger partners as they believe them to be safe from STIs/HIV and young women feel that older men are established, secure and therefore safer partners compared to younger males (49). Recently in South Africa, the term 'blesser' has been used to describe older men who engage in transactional exchanges with young women. In these relationships there are often large power imbalances and transactions of money, goods or gifts, which makes negotiating condom use more difficult for young women (49-51). Rates of reported age-disparate relationships in South African adolescent women 15-19 years old increased from 18.5% to 33.6% between the periods of 2005 to 2012 (37), indicating these transactional relationships may be becoming more normalized, threatening previous reductions in HIV incidence among this priority population. During the May 2016 Budget Vote the Minister of Health announced that the nation will be investing in a 3 billion Rand (approximately 290 million CAD) campaign aimed at reducing intersecting vulnerabilities (e.g. economic dependence and experiences of gender-based violence) experienced by young women (52).

The multi-levelled and intersecting factors disproportionately affecting HIV acquisition among adolescent women necessitates the need to offer combination biomedical interventions (e.g. pre-exposure prophylactic [PrEP] rings, pills and microbicide gels) (53, 54) with behavioural (e.g. education and skill building) (46, 55-57) and structural initiatives (e.g. microcredit and economic empowerment programming) (58, 59).

1.2.3 HIV prevention efforts and gender in South Africa

As the HIV epidemic occurring within South Africa is increasingly affecting young women at disproportionate rates, research and prevention efforts require a broader understanding of the gendered dynamics that place young women at high risk of HIV acquisition. Although there has been some recent advancement in increased options for women-controlled HIV prevention, such as Pre-Exposure Prophylaxis (PrEP) (in oral, ring, and microbicide formulations) (60), male condoms, remain to be the primary promoted HIV prevention mechanism and most inexpensive form of contraception (61). The most recent national health survey in South Africa found that since 2008 consistent condom use reporting among adults 15 to 49 has declined (from 45.1% in 2008 to 36.2% in 2012) (37). Condom use among adolescents may be particularly challenging as South African policies aimed at increasing access to condoms in school are unclear, leaving individual school boards to decide if they will distribute condoms (62). Moreover, even when adolescents have access to and education surrounding condoms, condom use negotiation remains extremely complex.

Correct and consistent condom negotiation and use relies on multi-levelled individual, social, relational and structural factors. On the individual level, psychosocial determinants including sexual beliefs, perceptions, attitudes, and social norms about protective measures and level of intimacy are important determinants for condom negotiation and use (63, 64). If one does not feel like they will use a condom, or could ask their partner to use a condom, condoms will likely not be used (63, 65). Relationally, intimacy and type of sexual partnership plays an influential role in condom use negotiation and intentions for both adolescent women and men (66-68). On a larger socio-structural level, Connell's conceptualization of hegemonic masculinity (69), which is shown to be high among young men in South Africa, creating opportunities for HIV to spread (70-74). For example, Shai, Jewkes, Levin, Nduna & Dunkle (2012) found that

young men possessing dominant, conservative gender attitudes were more likely to perpetuate violence against women and be inconsistent in the use of condoms, thus increasing HIV risk for young women (48).

1.2.4 Sexual Self-efficacy and psychosocial HIV prevention efforts among adolescents in sub-Saharan Africa

A large number of HIV prevention efforts among adolescents in sub-Saharan African settings have been conducted under psychosocial theoretical lenses, such as Bandura's theory of self-efficacy (75). Self-efficacy is the confidence in one's ability to preform a given outcome (75), and within some instances has been used interchangeably with the term 'perceived behavioural control' (65). Self-efficacy has been included within a number of psychosocial theoretical models including the socio-cognitive model (SCM) (76) and Social Learning Theory (SLT) (77). The SLT and SCM acknowledge that learning, behavioural intentions and actions take place within social contexts (76, 77). As demonstrated in **Figure 1-2**, Bandura has identified major components required for determining behaviours that protect against HIV infection (63). Furthermore, within the SCT, Bandura posits that beyond the knowledge needed to increase awareness about performing a difficult outcome, appropriate negotiating skills (e.g. self-regulating skills), and peer or familial support are necessary to instil positive beliefs, attitudes and high perceived behavioural control over a given outcome (63).

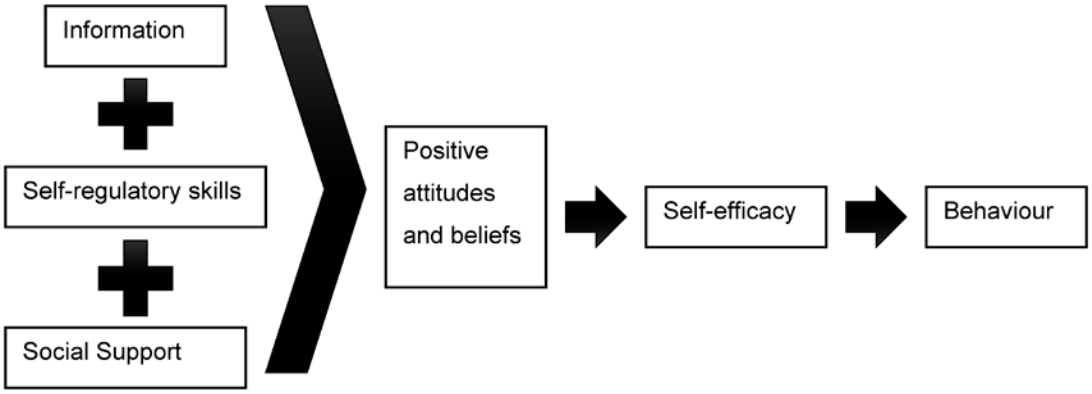

Figure 1-2 Bandura's major components which describes the influence of perceived self-efficacy on behaviours that carry risk to HIV infection (Figure developed from described pathways in Bandura A. Perceived self-efficacy in the exercise of control over AIDS infection. Evaluation and Program Planning. 1990;13: 9-17)

In order to assess the influence of SSE in determining adolescent sexual decision-making, a number of different scales for measuring SSE have been developed (78-80). Items included within these scales often focus on asking participants about their confidence to perform sexual preventative behaviour such as condom use (80-84).

The application of Bandura's theory within cross-sectional adolescent SRH studies have found a correlation between high-SSE, increased condom use and a reduction of high HIV-risk behaviours in numerous Western (79, 85, 86) and Sub-Saharan African based studies (87-91). The evidence however is mixed on whether or not this construct is equally predictive of sexual behaviour by gender (92-94). The differential ability for men and women to enact SSE into action has been the focus of much scientific debate (95). For example, Amaro's 1995 work found that having SSE did not translate into preventative actions (e.g. condom use). For women, Amaro argues that psychosocial theoretical models for understanding HIV risk reduction (e.g. SCM) need to consider broader structural determinants and the role of social status, relationship dynamics and how male partners play a critical role in the ability to negotiate condom use (95). To date there remains a lack of scientific consensus on the ability for high-SSE to translate into HIV prevention behaviours, particularly among high-risk demographics such as adolescent men and women in South Africa.

1.3 Gaps in the Literature

Despite the extensive literature examining the influence of SSE in regards to the SRH of adolescents in HIV hyper-endemic settings, many gaps remain. The results and methods used within studies examining SSE among adolescents in sub-Saharan African settings are not consistent, and findings remain mixed.

Reliability in SSE constructs need to be considered within the context of the setting they are being applied within. For example, in regards to the HIV epidemic within South Africa, gender is a particularly important social determinant of SRH that strongly influences sexuality and decisions surrounding HIV prevention applicability (96). Due to the fact that AYA women in South African face disproportionately high HIV incidence rates compared to adolescent men, the majority of gender-focused efforts have been targeted towards women. The epidemic however does not occur within silos and thus dyadic and gender inclusive responses are needed. Global public health researchers are

calling for increased attention on adolescent men's beliefs and perceptions surrounding sexual relationship power and condom use, and how these may be influencing HIV risk factors for themselves and their female partners (or future partnerships) (97). In order to be inclusive of the differential experiences of sexual decision-making among adolescent men and women **further analyses are needed to examine the gendered difference in the social determinants and effectiveness of SSE's influence on preventative sexual behaviour.**

Furthermore, much HIV prevention research in sub-Saharan Africa that has incorporated psychosocial theory into their analyses fail to ignore the importance of larger structural determinants of individual beliefs and perceptions (98-103). For example, sexual relationship power, experiences of violence and mental health issues, including high levels of depression have continuously been linked to HIV risk factors including low condom self-efficacy and inconsistent condom use in South African settings (104-108). Few studies, however, have examined the differential mediating effect of social determinants of health and relationship dynamics on SSE and condom use for adolescent men and women. **As we move towards the scale up and implementation of important gender-transformative interventions, it is paramount that we have a better understanding of how socio-structural determinants interact with SSE differentially for adolescent men and women.**

Using a theoretically informed, multi-dimensional approach to adolescent sexuality, this thesis will present findings from the available literature regarding gender differences in SSE and HIV prevention practices among priority populations of adolescents living in the hyper-endemic setting of Soweto, South Africa.

1.4 Relevance

Adolescent women continue to face disproportionate HIV incidence compared to adolescent men (109-111). As we move towards achieving an AIDS-free generation by 2030 we must consider the importance of gender-transformative interventions which seek to challenge and critically question multi-levelled factors influencing harmful and ridged gender roles and societal norm (34, 112-114). These multi-level change strategies include female-centred biomedical prevention mechanisms such as PrEP, microbicides and female condoms (115). Ambitious international targets such as

UNAIDS goals to end AIDS by 2030 (116) risk failure if we do not simultaneously address the gendered and multi-levelled determinants to HIV acquisition, which include sexual decision-making, among priority populations of adolescents living in HIV hyper-endemic settings.

Furthermore, by critically evaluating the use of SSE within HIV endemic sub-Saharan African settings, this thesis will help to expand on existing measures, methods, and interpretations of the complexities in adolescent sexual decision-making. The analyses presented within this thesis add to existing literature examining the social determinants of SSE overall and by gender, and the impact that high-SSE has in predicting consistent condom use among a sample of younger aged adolescent men and women in South Africa. I hope that results from this thesis can be used to develop future measures and theoretical frameworks of sexual behavioural, which are culturally relevant, gender-sensitive and youth-centered.

The research outlined below seeks to fill critical gaps in knowledge surrounding the factors impacting and being impacted by the perceived ability for young people in South Africa to enact protective sexual behaviours, specifically condom use, when engaging in sexual relationships. It is my hope that results from this thesis will help researchers and policy makers to better address the HIV prevention priorities of adolescent men and women living in HIV hyper-endemic settings.

1.5 Study Objectives and Hypotheses

The overall aim of this thesis was to assess gendered differences in sexual self-efficacy (SSE) among South African adolescent men and women. These aims will be supported by two study objectives and hypotheses:

Objective 1: To measure the prevalence and correlates of high-SSE versus low-SSE among adolescents (aged 14-19 years) in Soweto, South Africa stratified by gender.

Evidence suggests that levels of SSE differ between adolescent men and women living in HIV endemic settings (106, 117-119). High-SSE for women has been shown to be more protective at refusing sex than condom use (120). Although there is conflicting evidence surrounding the effects of SSE this study hypothesizes that:

- *Hypothesis 1*: Adolescent women will have higher SSE than adolescent men
- *Hypothesis 2*: Correlates of high-SSE will align well with Bandura's theory for adolescent men (e.g. sexual beliefs will be correlated with SSE). For ßadolescent women, socio-structural determinants (e.g. less relationship power and experiences of violence) will be associated with reduced SSE.

Objective 2: To measure the prevalence of consistent condom use and the association between high SSE and consistent condom use among sexually experienced adolescents, stratified by gender (aged 14-19).

Many studies have found that self-efficacy is a strong determinant for HIV protective behaviours such as unwanted sexual refusal and condom use among adolescents living in HIV-endemic nations (91, 105, 121, 122), however questions about the gendered differences in the association between SSE and sexual refusal and condom use remain unclear. Considering the highly gendered nature of sexual decision-making and behaviour (68), extremely high levels of community and intimate partner violence (IPV) and unequal relationship power experienced by young women in South Africa (123-126) this study assumes the following hypothesis:

- *Hypothesis 1*: High-SSE will be independently associated with consistent condom use among adolescent men but not women.

1.6 Study design and Setting

1.6.1 Botsha Bophelo Adolescent Health Study (BBAHS)

The Botsha Bophelo Adolescent Health Study (BBAHS) was used to examine factors associated with sexual self-efficacy and consistent condom use. BBAHS was an interviewer-administered cross-sectional survey of 830 adolescents (14-19 years) conducted through the Kganya Motsha Adolescent Centre (KMAC) and the Perinatal HIV Research Unit (PHRU) in Soweto, South Africa, between June 2010 and June 2012 (127). In response to evidence surrounding adolescent barriers to accessing HIV voluntary counselling and testing (HIV-VCT), KMAC was founded in 2008 to offer free adolescent-friendly SRH services for in and out-of school adolescents aged 14 to 19. In partnership with the PHRU, this USAID funded project was one of the first adolescent-specific SRH clinics in sub-Saharan Africa (30). However, due to limited funded is no

longer running, indicating a need to source local and sustainable funding in order to link and retain adolescents within SRH and HIV services (30).

Botsha Bophelo was chosen as the name of the study by the community advisory board (CAB), and is a SeSotho saying which loosely translates to mean “Youth and their health”. The interviewer-administered questionnaire was developed between the study team and the PHRU adolescent CAB. Prior to the roll-out of the BBAHS, surveys were piloted among adolescents living in Soweto. The study team worked with adolescents living in Soweto to describe concepts and culturally appropriate terminology to challenging English words including sexual terminology. Interviews were available in both English and Zulu (the most common language in Soweto). Surveys were conducted by trained local interviewers using Survey Monkey (128) via computer or iPad. The data from the BBAHS has been removed from the Survey Monkey (128) site and no unique identifiers were ever used on the site. The original study objectives of the BBAHS were determined by the driving questions at the time of survey development in conjunction with South African partners and include: 1) examine individual and socio-structural determinants of HIV VCT among participants; 2) evaluate the use of HIV prevention services among study participants, including medical male circumcision and condom use; 3) analyze how HIV knowledge translates into HIV prevention resource use, and 4) determine the prevalence of risks and protective factors associated with HIV among adolescents. The BBAHS was a collaboration between Simon Fraser University (Canada) and the PHRU.

1.6.2 Sampling strategy/Data collection for BBAHS

The BBAHS used community-based rather than institutional-based recruitment, which allowed the inclusion of both in and out-of-school adolescents. Recruitment occurred at community centres, shopping centres, and areas around schools, within 41 identified formal and informal townships and through KMAC. The recruitment strategy aimed to enroll more females than males (60% vs. 40%), older adolescents (18 to 19) to ensure a higher proportion of sexually active adolescents. Potential participants were approached and informed about the study and provided a contact card. Interested participants were asked to provide informed consent or assent and guardian consent for those under 18. Once enrolled, participants completed interviews at either KMAC or the PHRU, whichever was more convenient. Each participant was given a unique code,

which contained no personal information on the interviews to maintain confidentiality. All adolescents who came forward for recruitment were offered HIV-VCT.

1.6.3 Ethics

Informed consent/assent was completed by all BBAHS participants. If the participant was under the age of 18, parental/guardian consent was also required for participation in the study. BBAHS has received research ethics board approval from institutions both within South Africa and Canada including the University of Witwatersrand in South Africa (M090449) and Simon Fraser University (2009s0196) and the University of British Columbia in Canada (H13-01845). The proposed research outlined for the purpose of this thesis has received ethics approval from Simon Fraser University (Study Number: 2016s0048) and The University of British Columbia providence health care (UBC-PHC) research institute (UBC-PHC REB number: H16-00497).

1.7 Summary

This paper-based thesis is divided into 5 chapters. **Chapter 1** outlines the background, rationale, and objectives of the study. **Chapter 2** presents a literature review examining the factors influencing and being influenced by sexual self-efficacy (SSE) among young people in Sub-Saharan African settings, ways in which interventions have successfully or unsuccessfully improved SRH outcomes through shifts in SSE and the ways in which these individual and structural factors influence HIV risk within this demographic. **Chapter 3** uses BBAHS data to examine gender differences in prevalence and correlates of SSE. **Chapter 4** also uses BBAHS data to examine the independent relationship between high-SSE and consistent condom use stratified by gender. **Chapter 5** summarizes the findings and provides suggestions for areas of future research, as well as where intervention strategies should be targeted to address the high burden of HIV among adolescent men and women in South Africa.

Chapter 2. Gender and the influence of sexual self-efficacy on sexual behaviours for HIV prevention among adolescents and young adults in sub-Saharan Africa: A comprehensive literature review

2.1 Abstract

Sexual self-efficacy (SSE)– also known as perceived control- is a commonly used predictor of sexual behaviour. Among adolescents and young adults (AYA), mixed evidence exists in whether this relationship holds equally for men and women living within HIV endemic settings. We reviewed peer-reviewed and non-peer-reviewed literature published between 1995 and 2016 focusing on adolescents (10-19 years) and young adults (20-26 years) in sub-Saharan Africa to: (1) identify measures of SSE used in the HIV prevention literature ; (2) evaluate the influence of SSE on condom use and refusal of sexual activity, overall and by gender; and (3) to explore factors associated with high SSE, overall and by gender. We identified 63 articles from 44 different studies measuring SSE and examined associations with sexual decision-making and sexual behaviours among AYA in 14 sub-Saharan African settings. Different measures of SSE are used throughout the literature, with no standard definitions applied, including 61 analyses (83.6%) measuring condom use self-efficacy (CUSE) and 40 measuring sexual refusal self-efficacy (SRSE). Results reveal gender differences in levels and types of SSE among AYA, with women often having higher SRSE, while men were found to have higher CUSE. Cross-sectionally SSE was generally associated with sexual behaviour. Results from longitudinal and experimental designs reveal that high CUSE often predicted reported condom use among AYA men, but not women. Common predictors of high-SSE included age, sexual experience, and relationship dynamics. Gender modified the directionality of the effect. Gender clearly impacts the translation of SSE from intention to behaviour, highlighting an important area for further exploration for the development and implementation of gender-transformative HIV/STI prevention interventions among AYA.

2.2 Introduction

As we move towards achieving global targets to reach an AIDS free generation, adolescents and young adults (AYA) remain a priority population for HIV prevention initiatives (50, 109, 110). Globally, 85% of incident HIV infections among adolescents (aged 10-19) occur within sub-Saharan Africa (110). AYA women in sub-Saharan Africa are particularly affected, with 25% of all new HIV infections among adults occurring among AYA women (aged 15-24), compared to only 12% among AYA men (1, 9).

The social constructions of gender and dominant roles of masculinity and femininity in regards to sexual behavioural practices and the HIV epidemic have long been established (70, 95, 129-134). For AYA women in sub-Saharan Africa, the disproportionate burden of HIV is largely driven by multi-levelled gendered dynamics and determinants, including earlier sexual debut (135), inconsistent and incorrect condom use (61), high levels of sexual violence, and reduced ability to negotiate condom use due to unequal power dynamics in relationships (70, 72, 95, 125, 133, 136-140). Although research and resources have been scaled-up to reduce HIV incidence in AYA, and there are growing efforts to address the disproportionate burden of HIV among AYA women (50, 109, 110), to date no behavioural intervention has been shown to significantly reduce HIV incidence among this priority population (31, 57, 141). Thus, critical questions remain in understanding how to best improve sexual and SRH outcomes such as HIV transmission in priority populations of young people, particularly AYA women.

Theoretically driven methods within epidemiology are fundamental for addressing social inequities and understanding the complexities of individuals' lives (142, 143). Furthermore, these theoretical understandings of behaviour change are important to inform measurable and attainable solutions to public health challenges (144). This is particularly true for AYA as they transition from childhood into adulthood and begin to make important sexual health decisions with implications across the life course (142, 143).

A large number of global research studies among adolescents have focused on understanding determinants of sexual behaviour (including abstinence, sexual refusal, and condom use) using theoretical frameworks that conceptualize individual level

behaviour. One such construct, self-efficacy, is a widely used and important component of health behaviour change (75, 145, 146). Self-efficacy, theorized by Albert Bandura in the 1970s and nested within the socio-cognitive theory (SCT), refers to the confidence in one's ability to perform a given outcome (75).

Sexual self-efficacy has been widely used to explore and understand HIV prevention strategies among AYA (84, 86, 142, 147, 148). Within western settings, this construct has been used as a determinant for sexual well-being among AYA (25). A number of studies have explored whether high sexual self-efficacy (SSE) translates into safe and healthy sexual decision-making and increasing uptake of protective sexual behaviours (7, 100, 101, 103, 149-155). Gender is a known determinant of sexual decision-making,(152) yet many analyses utilizing constructs fail to consider larger gender differentiated determinants of SSE, as well as the differential impacts of SSE on sexual behaviour by gender. (95, 106) For example, the ability to enact male condoms use is clearly a gendered experience, where men have substantially more control (73, 132, 156). Utilizing constructs of SSE as a standard for behavioural intentions and outcomes thus may not be equally applicable for men and women (95, 132). This may be, particularly true within adolescent sexual relationships that present high levels of age-disparities and relationship power inequities, influencing personal and societal-level agency in sexual decision-making surrounding the use of male-controlled prevention mechanism such as male condoms (157, 158)

Much of this research has examined the association between SSE and sexual behaviour within lower-HIV risk settings (100, 101, 149, 152-155, 159, 160). Within sub-Saharan African settings with generalized HIV epidemics, SSE messaging within HIV prevention programming is widespread and often used interchangeably with messaging aimed at empowering AYA to enact positive sexual-decision making (161, 162). Despite widespread use, critical gaps remain in understanding the role that SSE plays within sexual decision-making practices among priority populations of adolescents and young men and women living within sub-Saharan African HIV endemic settings.

This paper presents a review of the literature on SSE among adolescents living in HIV endemic settings in Sub-Saharan Africa, considering gender. To the best of our knowledge, there has been no comprehensive review to examine the literature on the use of SSE constructs within research focused on AYA men and women in sub-Saharan

African settings. Thus, the **objectives of this review are:** (1) to identify the measures of SSE used in the HIV prevention literature regarding AYA; (2) to evaluate the impact of SSE on key sexual behaviours including consistent condom use and refusal of unwanted sex, overall and by gender; and (3) to explore the factors associated with high-SSE overall and by gender.

2.3 Methods

2.3.1 Theoretical Framework

Although Bandura's SCT attempts to examine the impact of the perceived environment and considers social influences in health behaviour and decision-making, traditionally this theory has mainly been used to examine micro-level associations between knowledge, beliefs, perceptions of the environment and behaviours (76). Bandura's theory has been widely critiqued because it largely neglects the broader socio-structural environments, including gender, within which sexual decision-making are shaped (92, 102, 152, 163). Furthermore, compared to western contexts in which individual-level psychosocial theories of behaviour originated, decision-making processes within many sub-Saharan African settings may be more collective in nature, indicating that individual-level constructs of behaviour change may be less predictive of behavioural outcomes (92, 164).

In recent years, there has been an increasing understanding that SSE, or sexual confidence, is influenced by macro-level factors that are important for understanding sexual decision-making, well-being, and behaviour among AYA in sub-Saharan Africa (90, 105, 106). For example, a group of researchers in South Africa have adapted theoretical understandings to sexual decision-making (e.g. perceived control or self-efficacy) and behaviour based off of Connell's theory of gender and power (165, 166). Under this theoretical lens, evidence within the context of South Africa has demonstrated that women's health and agency in the ability to negotiate HIV preventative behaviours in sexual relationships is highly influenced by ingrained societal-level hegemonic norms of masculinity and unequal power in sexual relationships (69, 72, 105, 139, 162, 166, 167). In order to address some of the gaps and critiques of Bandura's theory, and build upon previous gender-sensitive studies within South Africa, we adapted the SSE framework under a gendered lens (see **Figure 2.1**), which seeks to understand the

differential factors associated with high-SSE (e.g. socio-economic status, psychosocial factors, risk factors) and whether SSE is equally associated with HIV preventative behaviour such as consistent condom use among AYA men and women.

Under this theoretical framework, this thesis seeks to address knowledge gaps in gendered differences in what social determinants differentially predict heightened SSE, as well as the association between SSE and sexual behaviour among adolescents living within an HIV hyper-endemic setting. Moving beyond a framework that focuses solely on adolescent sexuality as risky, using theoretical constructs such as self-efficacy can help to promote positive and normative narratives into adolescent SRH research, and, as illustrated in the conceptual framework, how the perceptions of one's ability to perform protective behaviours are mediated or hindered by multi-dimensional individual (e.g. psychosocial attitudes and beliefs) and socio-structural factors such as relationship control, poverty, level and quality of education and high rates of community violence among others. Furthermore, in line with Connell's theory of gender and power, due to unequal power in society and relationships, the pathways to sexual-decision making highlighted within the framework will be differentially determined for adolescent men and women (165-167).

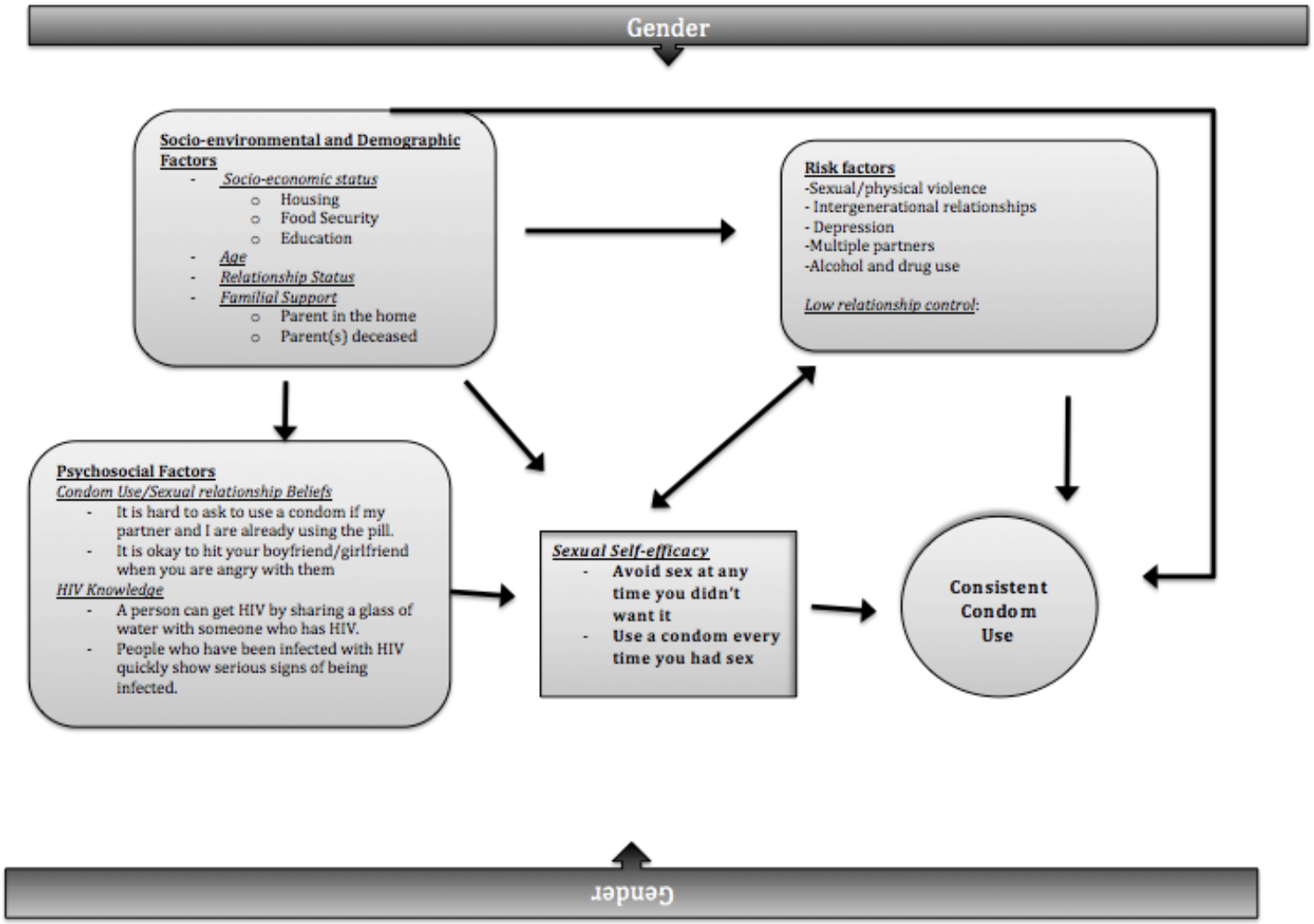

Figure 2-1 Pathway for how socio-structural and demographic factors and sexual self-efficacy may influence consistent condom use for South African adolescents

2.3.2 Search Methods

We conducted a comprehensive review of peer-reviewed and non-peer-reviewed literature published between 1995 and 2016 focusing on adolescents (aged 10-19 years) and young adults (aged 20-26 years) in sub-Saharan African settings. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used to develop the review process described herein (168). The initial literature search was conducted in May 2015 through to October 2016 using PubMed, the library database of Simon Fraser University, with additional articles included from Psych INFO. Articles were identified with the search terms “adolescent*” or “youth”, and “self-efficacy” or “perceived behavioural control” and “Africa” and “adolescent* or youth”, and “self-efficacy or perceived behavioural control” and “Africa*” NOT “African-American” or “African American”.

Detailed notes were made regarding the aim of each study, sample population, methods (e.g. type of study) and measures used, reliability and description of the SSE scale, and results relating to self-efficacy and sexual outcomes (e.g. condom use) (See **Appendix B**).

Inclusion Criteria

I examined all titles from the initial search and inputted them into Endnote, where abstracts were reviewed to assess eligibility of studies. In order to meet the stated objectives of this review, included studies focused on adolescents living in HIV endemic settings (defined as having a generalized HIV epidemic of 1% or more of the general population) (169) in sub-Saharan Africa, and used a quantitative survey-based measure of sexual self-efficacy (SSE), which was used to predict sexual behaviour or behavioural intentions. As this review is focused on the important transitional period between childhood and adulthood including adolescence (aged 10-19 years) and young adulthood (20-26 years) (1, 27), we restricted studies to AYA (aged 10-26 years). If no age range was provided, if the median age of participants was within the WHO definition range of ages 10 to 19 (1), the study was included. Furthermore, as the purpose of the review was to specifically explore gendered outcomes and factors associated with SSE, studies were coded as 0=Male participants only, 1=Female participants only, 2= Multi-gendered participants with gender segregated analyses and 3= multi-gendered

participants without gender segregated analyses. Notes regarding specific gendered findings were documented for each reviewed article presenting gender-disaggregated data (see Appendix B).

2.3.3 Statistical Methods

In order to explore the differences in types of SSE measurements used within sub-Saharan African AYA HIV prevention research we examined the associations between different demographic and SSE scale level variables among the analyses included in the review (**Table 2-1)** and assessed differences using Fisher's exact test.

2.4 Results

The initial search yielded 284 articles from PubMed and 99 articles from Psych info with 46 duplicates, and 1 additional article identified through bibliographic searches, resulting in a final 338 articles published between 1995 and 2016. Articles were excluded for one or more of the following reasons: the full-text article was not available (n=14); published in a language other than English (n=1); was described as a commentary (n=1), review article (n=10) or a qualitative study (n=6); did not focus on the age limit criteria described above (n=56); was not conducted within a sub-Saharan African country (n=59); or, did not include SSE constructs either as the main outcome or explanatory variable within the analysis (n=128), leaving a total of 63 articles included in this review (see **figure 2.3)**.

The 63 reviewed manuscripts came from 44 distinct quantitative studies and one mixed-method analysis from 14 countries within sub-Saharan Africa, in which 35 included specific gender-stratified analyses. Within the 63 analyses included in this review, we found 43 SSE items within 52 distinct scales. Inconsistencies in scale items precluded opportunity to conduct a meta-analysis. The results presented herein thus represent a comprehensive review of the literature.

We identified studies assessing SSE among adolescents from 14 sub-Saharan African countries. The majority (47.6%) of analyses were conducted in South Africa (n= 30), 41.3% were conducted in Eastern/Western African nations (e.g. Kenya, Nigeria, Uganda), and 7.9% were conducted in other southern African nations (e.g. Zambia,

Swaziland) (n=6). Two studies (3.2%) were multi-national. Of the articles reviewed, 5 analyses (7.9%) were conducted among women only, and one among men only (1.6%). Of the remaining 57 that included adolescent men and women, 35 articles (55.6%) described gender differences in SSE and or HIV preventative behaviours within their analyses. The median sample size from all studies included within this review was 1095 (Q1, Q3=454-222), with 46% of studies having a sample size between 1001 and 5000 participants. Age categories among the articles included in this review were mutually exclusive with the majority (57.1%) including adolescent participants under the age of 15 (n=36), 34.9% included young adults 20 to 26 years old (n=22) and 7.9% (n=5) included only those between the ages of 16 to 19.

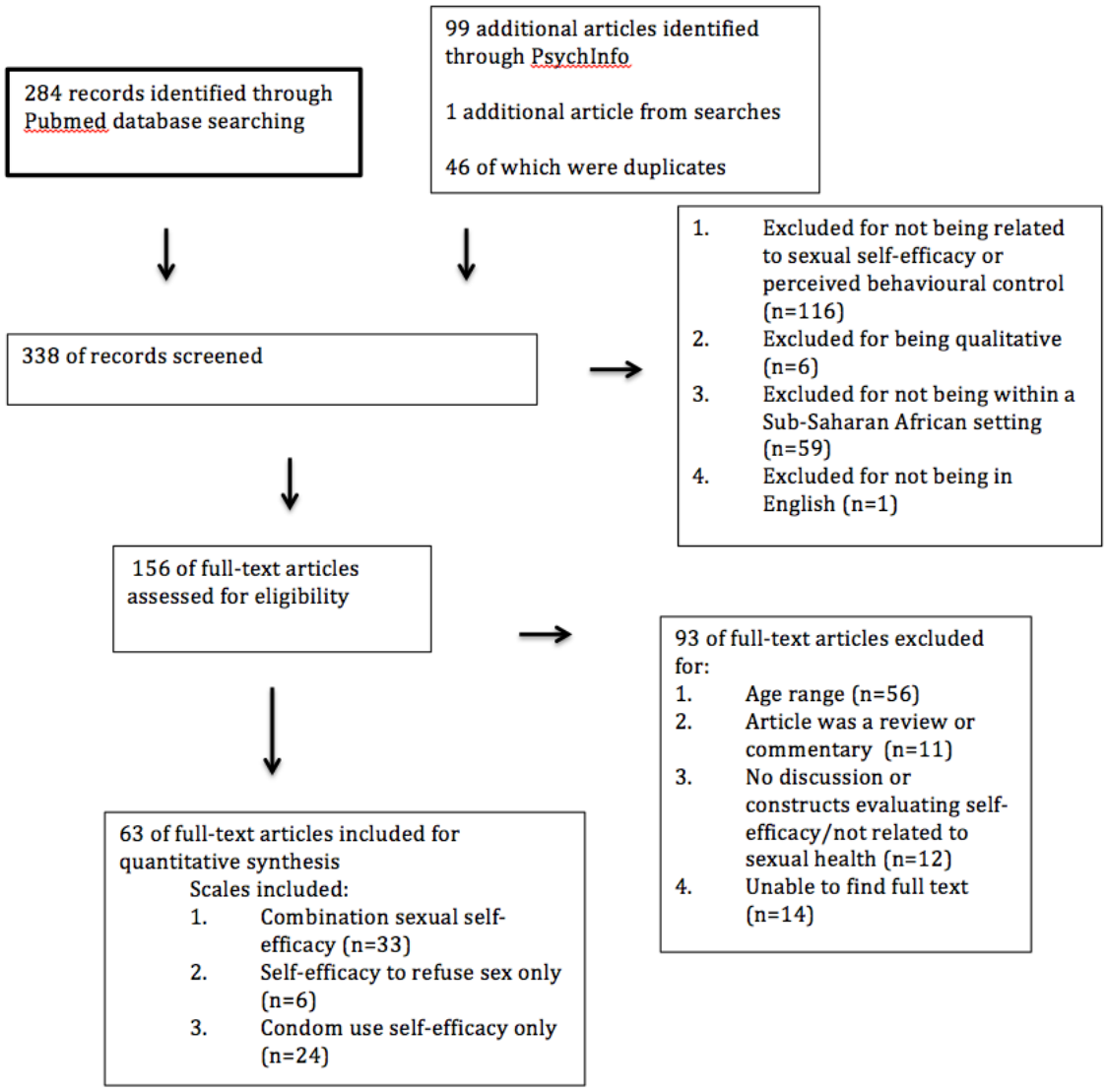

Figure 2-2 Flowchart for inclusion/exclusion criteria for literature review

2.4.1 Sexual Self-efficacy measures

Within the 63 articles included in this review, we identified a total of 73 individual scales measuring sexual self-efficacy (SSE) ranging from scales incorporating a single item (170) to 20 items (119, 171), with a median of 4 (Q1-Q3=3-7) scale items. Among the different scales and items used to measure SSE, 90.5% of analyses included some form of measuring condom use self-efficacy (CUSE) (n=57) (e.g. *would you be confident you could ask your partner to use a condom),* followed by 61.9% of studies measuring a construct of sexual refusal self-efficacy (SRSE) (n=39) *(e.g. would you be able to refuse sex anytime you didn't want to?*). The majority of analyses included one scale to measure a combination of the aforementioned constructs of SSE (87.3%), with 6 studies (9.5%) utilizing 2 scales and two analyses (3.2%) including 3 different SSE scales.

Among the studies which conducted scale validity tests (n=55) Cronbach alpha scores ranged from 0.51 (172) to .98 (122), with the highest proportion of scales used within the studies included in this review having a Cronbach between 0.71 and 0.80 (30.1%). Only 17 studies reviewed presented SSE scales developed from previously validated scales (**Appendix B)**. The most common SSE scale cited within this review was developed from Hanna's 1999 condom use self-efficacy (CUSE) scales for AYA.(84). The original 14-item scale was adapted by 9 articles written from 5 studies within this review, one of which excluded 3 items (161), with 2 studies and 3 analyses utilizing a 4-item scale (88, 173), and the remaining 2 studies using the same 5-item South African adaptation of the Hanna scale within 5 analyses (88, 90, 99, 173-175). A few studies cited adapting their scales from studies which validated self-efficacy in western contexts including two (147, 176) citing Basen-Enguist and colleagues 1999 study measuring the validity of psychosocial determinants of HIV/STD-related risk behaviour in American AYA (81). Previous research has suggested that individual studies and study populations conduct specific elicitation procedures including preliminary focus groups and validity tests to represent the specific contexts in which the SSE measurement is taking place (177). The majority of studies within this review discussed adapting the SSE scales in order to best represent their participants and the contexts in which the studies were taking place.

Table 2.1 presents the results from bivariate analyses examining the association between demographic and scale-level variables among the 63 distinct analyses included within this review. Results reveal that of the studies measuring SRSE 54.2% were published between 2006-2010 compared to 35.9% of those who did not measure SRSE (p=0.03). Compared with those who did not measure CUSE, those that did were less likely to have a lead author being from a study site institution versus a foreign site (35.1%, versus 83.3% p=0.03). Of the studies measuring CUSE 40.4% measured condom use at last sex and 36.8% measured consistent condom use compared to 0% and 33.3% of studies that did not measure CUSE, respectively (p=0.04).

2.4.2 Gendered differences in the association between SSE and sexual behaviour

In total, 35 articles (55.6%) included some form of gender analysis, 13 of which measured only CUSE (37.1%), 4 of which measured only SRSE (11.4%), and the remaining 18 (51.4%) measuring a combination of the two. Within these gender-stratified analyses, 26/35 were observational including 21 cross-sectional studies, 5 longitudinal analysis, and 10 analyses conducted as part of an intervention study. Given that uptake of HIV prevention strategies, such as condom use, is a systematically gendered and dyadic experience (178), it is no surprise that the results from this review reveal differences in the effects of self-efficacy on preventative behaviour by gender. These differences of effect, however, were not consistent across the different studies.

Cross-sectional studies

Our review revealed inconsistent results regarding gender differences in level and type of SSE. In three studies measuring SRSE, young women had higher SRSE compared to young men (117, 176, 179). However, among the 19 cross-sectional analyses measuring CUSE, nine found that men have higher condom use negotiation self-efficacy compared to AYA women (87, 93, 118, 161, 171, 174, 180-182), three reported that AYA women had higher CUSE compared to men (90, 106, 183), three found no gender differences in CUSE (88, 184, 185), and four did not report descriptive differences in CUSE by gender (90, 186-189).

Studies measuring Sexual Refusal Self-Efficacy

Overall, 19 cross-sectional analyses incorporated measures of SRSE. Of these studies, four measured only SRSE, of which one did not consider gender differences and found that higher SRSE predicted sexual abstinence (190). Among the remaining 15 studies that included SRSE as well as other constructs of SSE (e.g. condom use), the majority (n=11) did not measure the association between SSE and sexual activity or sexual initiation (93, 106, 117, 119, 164, 172, 173, 184, 187, 191, 192). One study found an association between high-SSE and later sexual initiation and increased number of lifetime partners among AYA women but not men (185), while one study found that high SRSE predicted sexual abstinence for AYA men but not AYA women (193). Two found that higher SRSE predicted delayed sexual intercourse, abstaining behaviours or engagement in “high-risk” sexual behaviour for all study participants (161, 171). Two found no statistical association between having higher SRSE and sexual inactivity or delayed sexual initiation among both AYA men and women (176, 179).

Studies measuring Condom Use Self-Efficacy

In total, 36 studies within this review were cross-sectional, 35 of which included measures of CUSE. Of the studies that measured CUSE, seven did not report actual condom use in their analysis (90, 150, 164, 170, 188, 194, 195). Among the remaining 28 studies that measured CUSE, 17 analyses (88, 91, 93, 105, 106, 147, 161, 171, 174, 180, 182, 183, 185, 186, 191, 192, 196) found that higher SSE was predictive of increased condom use, either consistent condom use or condom use at last sex, five found no relationship between having higher SSE or CUSE and consistent condom use or condom use at last sex (104, 122, 171, 181, 187), while the remaining seven studies did not measure the relationship between SSE and condom use within their analysis (87, 118, 119, 172, 173, 184, 197).

Among the 17 studies that found a relationship between high levels of CUSE and condom use, one included only AYA men, six measured the gendered differences in the relationship between high-SSE and condom use, of which four found the relationship to be predictive of increased condom use among both AYA men and women (174, 180, 182, 185), while one study found higher SSE was only associated with condom use at first sex (106), and one found that in the final multivariable models that this relationship remained only among AYA women (88).

These findings reveal that although many cross-sectional studies have examined the association between high-SSE and sexual behaviour, few have considered how gender mediates this association, highlighting an important area for future research.

Longitudinal Studies

One longitudinal found no association between higher SRSE and primary or secondary abstinence[1], while one found that higher SRSE and CUSE predicted earlier sexual initiation (198).

Intervention Studies

In our review of the literature, we identified 16 articles from 12 different interventions that included constructs of SSE. One of these were conducted as cross-sectional analyses and were presented in the previous section (199). The majority of interventions were school-based educational HIV prevention interventions including: the Life Skills program (170, 192, 200, 201), Let us Protect our Future (181, 182, 202, 203), Healthwise (75, 94), the World Starts With Me (182, 200, 204), and The Mpondombili pilot project (205), among others (121, 204, 206-210). Beyond school-based HIV prevention interventions, one intervention focused on reducing harmful alcohol use in order to address the HIV risk environment among AYA in Malawi (211, 212), while another utilized sports-based methods in order to improve the uptake of HIV prevention behaviour (e.g. condom use and delayed sexual intercourse) among AYA in Kenya (213).

Among the 16 intervention articles, one measured SRSE only (214), six measured CUSE (200, 205, 210, 213, 215, 216), and eight measured both or a combined construct of SSE (121, 201, 204, 207, 209, 211, 212, 217). Similar to the findings from the observational studies, intervention studies included in this review presented inconsistent results regarding whether higher SSE translated into sexual behaviours. Furthermore, the association between higher SSE differed by gender and type of sexual self-efficacy (e.g. condom use versus sexual refusal).

[1] Eggers and Colleagues 2016 defines primary abstinence as those who have never initiated sexual activity and secondary abstinence as those who have been sexually active in the past but intended to stay abstinent over the coming year

All of the interventions that only examined SRSE were able to increase SSE through their program and further showed that this translated into a reduction in sexual activity (211, 216, 218). Two found that this was only significant for AYA women and not AYA men (211, 216), and one found that higher SRSE predicted sexual abstinence for AYA men but not women (175).

Among the 14 intervention analyses that assessed CUSE, two did not report measures of actual condom use and thus we were not able to assess whether heightened SSE was predictive of sexual behaviour (215, 217). Of the remaining 12 studies, results remained inconsistent around whether heightened SSE predicted increased consistency in condom use. Five articles found that an increase in CUSE through the intervention did not predict an increase in consistent condom use (121, 204, 207, 211, 212). One of these articles found that the intervention was successful at improving CUSE only among AYA women; however, this did not predict condom use at last sex (205). Within the Let Us Protect our Future intervention the authors found an association between improved SSE and condom use at 12-months, however when followed over a longer period of time, results demonstrated that at 54 months this relationship was no longer significant (216). Contrary to gendered findings within the cross-sectional analyses, two intervention studies revealed that higher CUSE only predicted an improvement in condom use for AYA men and not AYA women (200, 209). Among one of these analyses, having higher CUSE was found to be negatively associated with condom use among AYA women (209).

A key finding from the literature review indicated that gender plays a significant role in the relationship between SSE and sexual behaviour particularly in predicting improved use of condoms through intervention programming among AYA.

2.4.3 Factors associated with sexual self-efficacy overall and by gender

We examined key predictors of SSE overall and by gender. Among the 63 analyses reviewed, 20 included details regarding predictors of SSE, 10 of which examined gendered differences and two that included AYA women only. Among the studies presenting data of the predictors of SSE we found a number of important factors

associated with heightened SSE among AYA in sub-Saharan Africa, including age, sexual experience, parental support, poverty and history of abuse or violence.

Socio-demographic factors related to sexual self-efficacy

Age and sexual experience

Two articles found that younger adolescents had higher SSE(117, 192), three articles found that older age was more predictive of higher SSE (181, 182, 200), while two studies found no association between age and higher sexual self-efficacy (106, 118).

The two studies finding an association between higher SSE and younger age measured delayed sex or abstinence related self-efficacy, indicating that sexual experience is also a likely determinant of SSE. In our review we found that two studies found that SSE was higher among those who had initiated sex (93, 187), and two found higher SSE among AYA who had not yet initiated sex (176, 183). Again, the type of SSE being measured is important in it's determinants as those who have initiated sex were found to have high CUSE, while those who have not initiated sex have high SRSE.

Socio-Economic Status (SES)

Among the six studies which included measures of SES in relation to SSE, three studies found that young people with higher SES or among those reaching higher educational attainment, may be more likely to have higher SSE (117, 171, 218), while three study found no association between measures of SES (e.g. housing, income or poverty level) and SSE (90, 106, 118).

Lower socio-economic status and education may influence one's ability to access condoms (93, 219). For AYA men, findings are inconsistent regarding whether or not having increased access to condoms is associated with higher levels of SSE. For example, access to condoms was found to be associated with heightened SSE in one study (106), while another found an inverse relationship with difficulty in acquiring condom use being associated with heightened SSE (90).

Relational-level determinants of sexual self-efficacy

Parental Support

Bandura's theory of self-efficacy discusses the importance that support and positive role modeling has on one's confidence to perform difficult tasks, including condom use and sexual refusal (175, 186-188). Results from five analyses aligned with Bandura's theory in demonstrating that positive family communication or support predicted heightened SSE, particularly for young women (118, 184, 185, 206, 220). Furthermore, lack of parental support was shown to predict earlier sexual debut among AYA women (185).

Relationship dynamics and experiences of violence

Seutlwadi and colleagues 2015, found that AYA women (aged 18-24) who ever experienced forced sex had lower SSE (173). AYA women reporting lower structural vulnerability (based off the vulnerable girls supportive community index) (170), who have not experienced sexual violence (173), and who have better sexual partner communication and knowledge surrounding HIV transmission (106) are more likely to have confidence in their ability to refuse unwanted sex and use a condom.

Slonim-Nevo and colleagues' 2007 study, found that the experience of child abuse among adolescents in Zambia was associated with low SSE, and increased sexual risk behaviour (119). The authors suggest that this relationship is likely mediated through consequences of child abuse to adolescent mental health (including depression) and substance use (119). For AYA men, one South African study found that important predictors of high-SSE included ever testing for HIV, ever having a transactional sexual relationship, and high relationship control (90).

2.5 Discussion

AYA within a number of sub-Saharan African nations face extremely high risk for HIV acquisition and thus have been the focus of numerous HIV prevention research initiatives (221-223). Many studies have utilized the construct of self-efficacy, a theoretical psychosocial theory, to assess and understand sexual decision-making among AYA (63, 86, 148). At present a growing body of literature has adapted these constructs into scales to be included within adolescent HIV prevention studies, including

a number of interventions aimed at improving SSE in priority populations of adolescents (90, 94, 171, 211). The results from this literature review found 52 distinct scales measuring SSE among AYA within 63 sub-Saharan Africa HIV prevention studies, with the primary sexual constructs measured being condom use and refusal of unwanted sex. Among the studies utilizing SSE scales within their analyses there exists an immense amount of adaptation to existing scales, as well as little consensus on the most valid or reliable measures for AYA in HIV endemic settings. Despite the uptake of HIV prevention strategies, such as condom use, being a systematically gendered and dyadic experience (178), 35% of articles included within this review did not conduct any gender-disaggregated analyses. Among those that did, we found stark gender differences are observed by type of SSE being assessed, with AYA women reporting higher SSE with respect to refusal of sex and abstinence and AYA men reporting higher SSE with respect to condom use. Furthermore, gender differences in the translation of SSE into behavior, particularly surrounding condom use, highlight that for women there are likely a number of factors intersecting to influence the ability to enact behavioural intentions into action.

Overall, there is strong cross-sectional evidence to suggest that high SSE is associated with sexual behaviour (e.g. high CUSE is associated with reported condom use behavior; high SRSE is associated with reported sexual refusal behavior). Critically, however, cross-sectional studies measure both explanatory and outcome variables at the same point in time making it difficult to make conclusions about the directionality of effect. Furthermore few studies stratified associations by gender. Those that did revealed that high CUSE was often associated with condom use for AYA men, but not AYA women, whereas high SRSE was associated with abstinence among AYA women, but not AYA men.

Among the articles utilizing longitudinal data analyses, a small proportion have shown that increases in SSE translate into sustained sexual behaviour however when followed over a longer time period this effect seems to diminish (216). Even among interventions specifically targeting increased SSE, only a small number have shown any effect in the translation into sustained sexual behaviour change (211, 216, 218). As longitudinal and intervention studies utilizing constructs of SSE demonstrate reductions in the effect that SSE may have on behaviour, highlights an important area for further research.

Lack of consistent evidence found within this review aligns with previous researchers critiques surrounding the use of individual-level psychosocial analyses to examine sexual decision-making among AYA in sub-Saharan Africa, arguing that such an approach fails to acknowledge the larger structural determinants to sexual behavior, HIV risk, and sexual decision-making (177, 224). Moreover, it fails to consider the role of gender, relationship dynamics and cultural norms of masculinity and femininity, which are critical to understanding and intervening on the burden of HIV risk among AYA in sub-Saharan Africa (48, 177). Particularly for women, there seems to exist barriers for enacting behavioural intentions to use condoms into action. Given the gendered nature of the HIV epidemic within the majority of HIV endemic settings within sub-Saharan Africa, there continues to exist a limited body of research available which critically examines gendered differences in the association between SSE and sexual behavior, as well as determinants of SSE, thus warranting future research.

Results reveal that sexual decision-making is complex and sexual empowerment messaging needs to consider gender and type of HIV preventative behaviour. For AYA women, results demonstrate that SSE is high pre-sexual debut, however numerous barriers to SRSE and CUSE are introduced when sexual activity is initiated. O'Leary and colleagues hypothesized that AYA pre-sexual debut, particularly AYA women, may perceive that they have the confidence to refuse sex or use a condom, but that these judgments are hypothetical, and thus may not be able to capture fully the perceived barriers and challenges to negotiate safe sex once sexual activity and sexual relationships have been initiated (203). For example, Boafo and colleagues 2014 found that younger aged AYA women have high self-efficacy to delay sex indicating that there is a need to examine and address underlying factors that prevent women to be empowered to enact condom negotiation and safe sexual practices within their sexual relationships following sexual debut (117). Results indicate that AYA women may use sexual abstinence (primary and secondary) to protect themselves against HIV and other unwanted sexual outcomes including unintended pregnancy. For sexually experienced women, findings regarding the importance of experiences of violence and inequitable relationship control have important implications for mitigating the increasingly feminized HIV epidemic as forced sex, intimate partner violence, and reduced power equity in relationships are known risk factors for increased HIV acquisition among AYA women in sub-Saharan Africa (90).

Although AYA women continue to face the highest HIV burden, our results indicate that we cannot leave adolescent men behind in the fight towards reducing HIV incidence among AYA in HIV endemic settings. Thus, targeted community efforts which address harmful gender norms coupled with widespread access to condoms and sexual health programming are needed to ensure AYA men are supported to grow up into adult men who have high SSE, can enact SSE into safe sexual behaviours, and have gender equitable beliefs, behaviours and actions.

Early childhood experiences, including a history of child abuse and coerced first sexual experience, have been previously associated with a number of determinants for HIV risk including STI acquisition (225), poor HIV knowledge and HIV risk behaviours (e.g. inconsistent condom use and multiple concurrent partners) (119). Furthermore, the relationship between forced sex and reduced agency in sexual decision-making has been found to be particularly important in HIV risk acquisition among AYA women in sub-Saharan Africa (50, 123, 226). If we are to see improved sexual health among AYA into adulthood, a scale-up in efforts aimed at reducing child abuse, intimate partner violence and the perpetuation of forced sex, as well as supportive services for survivors of abuse are needed (106). Also, in order to effectively address barriers for enacting SSE into action, the results from this review suggest that adolescent sexual empowerment messaging, which includes the promotion of SSE, needs to be adapted differently dependent on type of HIV preventative behaviour and for sexually experienced and inexperienced AYA men and women (95, 227-229). These efforts should include gender-targeted promotion of positive role modeling, increased access to high quality education, and economic generation and empowerment programming that are youth-engaged (92, 103, 150, 164).

2.5.1 Limitations and recommendations

An observed lack of consistency in the measurement and reporting of SSE items across studies constrain our ability to extrapolate these results across different regions and study sites. Although a majority of studies included some form of gender analyses within their results, few specifically included gender-disaggregated analyses to examine the influence of gender on the relationship between SSE and behaviour or determinants

of sexual decision-making to increase understandings of HIV risk. Furthermore, similar to previous HIV prevention reviews that include psychosocial constructs of sexual decision making, we found that very few articles consider the impact that relationship characteristics have in SSE and sexual behaviour (177). This is surprising given the gendered and dyadic nature of sexual decision-making and condom use negotiation, which have been particularly highlighted within sub-Saharan African nations (156, 230-232). Our findings thus reveal a gap in the inclusion and acknowledgement of the importance of gender as well as relationship dynamics within sub-Saharan African AYA sexual health studies that have incorporated constructs of SSE.

Another limitation is that due to the sensitive nature of the questions asked in the survey, it is possible that social desirability bias influenced adolescents' survey responses (233). Given the diverse contexts in which AYA within sub-Saharan Africa live and differing levels of HIV risk, it may not be feasible or desirable to develop cross-cultural/lingual scales. Rather, this work has shown that context is critical to understanding AYA SSE, sexual behaviour, and HIV risk. One of the objectives for our study was to explore the different SSE measures used within HIV prevention research among AYA in sub-Saharan Africa, and thus we did not include qualitative studies in this review. The exclusion of qualitative studies limits our ability to describe in depth the potential reasons why prevalence and determinants of SSE differ by gender. Future reviews should examine the qualitative evidence surrounding gendered differences in sexual decision-making. Furthermore, given the lack of consistency in scales used within this review, may require additional qualitative work, conducted by and with AYA in their respective communities, so that SSE scales may have better cultural relevance and internal and external validity (167).

2.6 Conclusions

Results of this review indicate that applying Bandura's theory of self-efficacy to within the context of HIV prevention among AYA in sub-Saharan Africa offers important insights to understanding sexual decision-making among this key population. The applications of this theoretical construct in reality however, differ by gender. High SRSE was an important predictor of delayed sexual intercourse among AYA women, and high CUSE is an important predictor of condom use among AYA men, but not vice versa. Furthermore, a number of socio-structural determinants differentially predict heightened

SSE for AYA men and women. Findings suggest that integrated and multi-levelled theoretical approaches are needed to improve understandings of the complexities involved in adolescents' sexual decision-making power. Psychosocial theoretical understandings such as presented by SSE theory should be integrated within theoretical frameworks (such as presented within this review), which aim to integrate broader socio-structural determinants of SRH and specifically consider the role of gender in sexual decision-making and behaviour.

As no single behavioural intervention has yet to show significant effects on reducing HIV incidence among AYA, there is a need for efforts to be restructured in order to address concurrently the multiple intersecting factors that place AYA, particularly young women, at heightened risk of HIV acquisition (57). In order to reverse declining rates of condom use among AYA(37) and reach international targets to 'end AIDS by 2030',(234) long-term interventions should seek to address multi-levelled determinants of HIV including poverty, low education and gender-based violence (23, 55, 235, 236).

Table 2-1 Bivariate analysis of sexual self-efficacy scales measuring sexual refusal self-efficacy (SRSE) and condom use self-efficacy (CUSE) within HIV prevention studies among adolescents and young adults (AYA) in HIV-endemic* countries in sub-Saharan Africa

	Overall (n=63)		CUSE only and combined CUSE/ SRSE (n=57)		SRSE only (n=6)		CUSE Yes vs. No	SRSE only and combined CUSE/ SRSE (n=39)		CUSE only (n=24)		SRSE Yes vs. No
	n	Col%	n	Col%	n	Col%	Fisher's exact test	n	Col%	n	Col%	Fisher's exact test
Condom use self-efficacy												
No	6	9.5	0	0.0	6	100.0	NA	6	0.2	0	0.0	0.074
Yes	57	90.5	57	100.0	0	0.0		33	84.6	24	100.0	
Sexual refusal self-efficacy												
No	24	38.1	24	42.1	0	0.0	0.074	0	0.0	24	100.0	NA
Yes	39	61.9	33	57.9	6	100.0		39	100.0	0	0.0	
Gender												
Young Men/boys only analysis	1	1.6	1	1.8	0	0.0	1.000	0	0.0	1	4.2	0.359
Young Women/girls only	5	7.9	5	8.8	0	0.0		2	5.1	3	12.5	
Gender analysis conducted	35	55.6	31	54.4	4	66.7		22	56.4	13	54.2	
Gender analysis not conducted	22	34.9	20	35.1	2	33.3		15	38.5	7	29.2	
Year of study Published												
Before 2005	8	12.7	8	14.0	0	0.0	0.593	3	7.7	5	20.8	0.031
2006-2010	27	42.9	25	43.9	2	33.3		14	35.9	13	54.2	
2011-2016	28	44.4	24	42.1	4	66.7		22	56.4	6	25.0	
Region Categories												
Southern African Countries Excluding SA	5	7.9	5	8.8	0	0.0	0.438	5	12.8	0	0.0	0.306
South Africa	30	47.6	25	43.9	5	83.3		17	43.6	13	54.2	

	Overall (n=63)		CUSE only and combined CUSE/ SRSE (n=57)		SRSE only (n=6)		CUSE Yes vs. No	SRSE only and combined CUSE/ SRSE (n=39)		CUSE only (n=24)		SRSE Yes vs. No
	n	Col%	n	Col%	n	Col%	Fisher's exact test	n	Col%	n	Col%	Fisher's exact test
East/West Africa	26	41.3	25	43.9	1	16.7		16	41.0	10	41.7	
Multiple Countries	2	3.2	2	3.5	0	0.0		1	2.6	1	4.2	
Age categories												
Included adolescents under the age of 15	36	57.1	31	54.4	5	83.3	0.131	25	64.1	11	45.8	0.341
Included those 16 to 19	5	7.9	4	7.0	1	16.7		3	7.7	2	8.3	
Included those 20 to 26	22	34.9	22	38.6	0	0.0		11	28.2	11	45.8	
Lead Author local?												
No	38	60.3	37	64.9	1	16.7	0.032	25	64.1	13	54.2	0.597
Yes	25	39.7	20	35.1	5	83.3		14	35.9	11	45.8	
Funding National?												
None Listed	21	33.3	19	33.3	2	33.3	0.610	11	28.2	10	41.7	0.035
Foreign funding	35	55.6	32	56.1	3	50.0		26	66.7	9	37.5	
National funding	4	6.4	3	5.3	1	16.7		2	5.1	2	8.3	
Both international and regional	3	4.8	3	5.3	0	0.0		0	0.0	3	12.5	
Measured Condom use												
No	17	27.0	13	22.8	4	66.7	0.042	12	30.8	5	20.8	0.722
Yes, at last sex	23	36.5	23	40.4	0	0.0		13	33.3	10	41.7	
Yes, consistent condom use construct	23	36.5	21	36.8	2	33.3		14	35.9	9	37.5	
Type of study												
Cross-sectional	41	65.1	36	63.2	5	83.3	1.000	26	66.7	15	62.5	0.788

	Overall (n=63)		CUSE only and combined CUSE/ SRSE (n=57)		SRSE only (n=6)		CUSE Yes vs. No	SRSE only and combined CUSE/ SRSE (n=39)		CUSE only (n=24)		SRSE Yes vs. No
	n	Col%	n	Col%	n	Col%	Fisher's exact test	n	Col%	n	Col%	Fisher's exact test
Longitudinal	6	9.5	6	10.5	0	0.0		4	10.3	2	8.3	
Intervention analyses	15	23.8	14	24.6	1	16.7		9	23.1	6	25.0	
Cross-sectional using intervention data	1	1.6	1	1.8	0	0.0		0	0.0	1	4.2	
Sample Size Category												
Less than 500	17	27.0	15	26.3	2	33.3	1.000	11	28.2	6	25.0	0.856
501-1000	10	15.9	9	15.8	1	16.7		6	15.4	4	16.7	
1001-5000	29	46.0	26	45.6	3	50.0		19	48.7	10	41.7	
5001-10,000	5	7.9	5	8.8	0	0.0		2	5.1	3	12.5	
10,001+	2	3.2	2	3.5	0	0.0		1	2.6	1	4.2	

Note: P-values in **Bold** are significant

CUSE, *Condom use self-efficacy;* SRSE, *Sexual Refusal Self-efficacy;* SA, *South Africa*

*HIV endemic country is defined as a country where the prevalence of HIV among adults (aged 15-49) is 1.0% or greater and 50% or more of HIV cases are transmitted through heterosexual sex. (169)

Chapter 3. Gender differences in determinants of sexual self-efficacy among adolescent men and women in Soweto, South Africa

3.1 Abstract

Sexual self-efficacy (SSE) - one's perceived control- has been shown to predict adolescents' HIV-prevention practices (e.g. condom use). Few studies have examined gendered differences in SSE. We used multivariable logistic regression to identify correlates of high-SSE separately among adolescent men and women (aged 14-19) living in Soweto, South Africa using a previously validated SSE scale (high-SSE [>3 /6 items]; study-alpha=0.75). SSE scale items assed self-efficacy related to sexual refusal (e.g. "Would you be able to refuse sex anytime you didn't want it?") as well as condom use (e.g. "Would you be able to use a condom every time you had sex?"). Adolescent women participants were significantly more likely to report high-SSE (72.3% versus 49.5%; p<0.01). High-SSE among adolescent men was associated with higher sexual relationship belief scale scores ([SRBS], higher scores=more positive beliefs, aOR=1.15, 95%CI= 1.05-1.27) and inversely associated with probable depression (measured by a CES-D score ≥24, study-alpha=0.81, aOR=0.57, 95%CI=0.35-0.95). For adolescent women, high-SSE was associated with increased HIV knowledge (aOR=1.30, 95% CI= 1.07-1.56) higher positive condom belief scale scores (aOR=1.09, 95%CI= 1.03-1.15), SRBS scores (aOR=1.19, 95%CI=1.08-2.70), having an adult in the home (aOR=2.08, 95%CI=1.06-4.05), and inversely associated with being 16-17 years old compared to 15 or younger (aOR=0.43, 95%CI=0.22-0.87), and ever experiencing physical violence (aOR=0.60, 95%CI=0.37-0.97). Differences in prevalence and correlates of SSE among adolescent men and women in South Africa highlight important areas for gender-sensitive interventions. Targeted efforts to reduce negative sexual beliefs, improve HIV knowledge and mental well-being may improve SSE and the uptake of HIV-preventative practices among adolescent men. For adolescent women disproportionately affected by the HIV epidemic in South Africa to be able enact sexual agency into action, it is

necessary for programming that focuses on building positive family relationships and reducing violence to begin early.

3.2 Introduction

Several behavioural HIV-prevention interventions and programming in South Africa, particularly those aimed at increasing rates of HIV knowledge, attitudes, beliefs and safe sexual negotiation skills, have been driven and informed by behavioural theory, including Bandura's theory of self-efficacy (121, 201, 202, 206, 208, 210, 237). Self-efficacy - also known as perceived behavioural control - is typically defined as one's confidence in their ability to perform a desired outcome (75). The theory posits, and evidence shows, that young people can perform difficult outcomes if they have the necessary awareness, supports, beliefs, skills and personal self-confidence to do so (75). For instance, Bandura's theory (63, 75) has been both theoretically (63, 82) and quantitatively associated with positive sexual health behaviours- including consistent condom use - among adolescents living in generalized HIV epidemics within Sub-Saharan Africa (91, 105, 106, 180, 182, 183, 185). As outlined in Chapter 2, beyond Bandura's individual-level determinants of behaviour, a number of socio-structural determinants, such as harmful gender norms and sexual relationship beliefs, as well as experiences of violence or abuse, depression, and family support have been identified within sub-Saharan African settings to play a significant role in adolescents' agency within sexual decision-making processes (108, 119, 137, 139, 236). Despite the widespread use of this construct and evidence within the context of South Africa demonstrating that high-SSE is associated with consistent condom use among adolescents (88, 91, 93, 105, 106, 147, 161, 171, 174, 180, 182, 183, 185, 186, 191, 192, 196), few studies have examined gender differences influencing SSE by gender (106, 199).

Given differing norms of masculinity and femininity which position men as having a 'right' to use a condom, while women must negotiate condom use with sexual partners, we undertook this analysis to address gendered gaps in the adolescent HIV prevention literature through an examination of the prevalence of SSE and the relational, behavioural and structural factors associated with high-SSE by gender.

3.3 Methods

3.3.1 Study design

The Botsha Bophelo Adolescent Health Study (BBAHS) is an interviewer-administered cross-sectional survey conducted between 2010 and 2012 in Soweto, South Africa. The BBHAS explored socio-behavioural characteristics and sexual and SRH outcomes of 830 adolescents. Interviews were conducted at the Kganya Motsha Adolescent Centre (KMAC) and the Perinatal HIV Research Unit (PHRU). Further details of the study have been described elsewhere in this thesis.

3.3.2 Participants

Participants aged 14-19 living in one of 41 identified townships were recruited using a targeted sampling approach designed to achieve the aims of the BBAHS (127, 238). To ensure representation from all geographical locations and capture in and out of school populations, a minimum of 15 adolescents from each of the 41 identified formal and informal townships (neighbourhoods) in Soweto were recruited in a number of different locations including community centres, shopping centres, neighbourhood parks and recreation areas, and locations around schools. Participants were reimbursed with a 50ZAR honorarium for their time and travel expenses and were also offered free HIV-VCT.

3.3.3 Data Collection

Participants completed a 45-60 minute interview-administered survey in English or Zulu with responses entered electronically using the online survey software Survey Monkey™ (128).

3.4 Ethical Consideration

This study was approved by research ethics boards of the University of British Columbia (Providence Health Care) (H13-01845) and Simon Fraser University in British Columbia,

Canada (2016s0048), as well as the University of Witwatersrand in Johannesburg, South Africa (M090449). Parental consent and adolescent assent was received for all participants aged <18 years and written informed consent was received from all participants aged 18 or 19 years.

3.4.1 Measures

3.4.2 Outcome Variable: Sexual self-efficacy (SSE)

The primary outcome of interest was a 6-item sexual self-efficacy (SSE) scale, with responses of “Yes”, “Probably yes”, “No” or “Probably no”. Scale items were adapted from previously validated scales to measure adolescents’ confidence in their ability to refuse sex, negotiate condom use, and initiate sexual health-related communication with potential partners (81, 84). Questions included “Would you be able to… *avoid sex anytime you didn’t want it*?” and “… *use a condom every time you had sex*?” Questions were asked to all participants whether or not they were in a current relationship or if they have had sex, thus for some participants responses were based off of hypothetical situations. See **Table 2** for the full list of six items and response options. Similar to Hanass-Hancock et al., 2014 (206), we dichotomized the scoring of the scale so that “Yes” responses were coded as 1 while “Probably yes”, “No” or “Probably no” were treated as “no” and coded as 0 (scale range 0-6). Scores >3 indicated high-SSE. In line with other adolescent SRH studies in South Africa, we decided to dichotomize the scoring in this manner so that an affirmative ‘yes’ would reflect adolescents having high-SSE (106). We tested the validity of dichotomizing the SSE scale items and found 84% sensitivity and 100% specificity between the original and dichotomized coding of the scale, with substantial agreement. All 6-items were highly loaded on a single factor.

After dichotomizing the scale items scoring the internal consistency measured by Cronbach’s alpha increased from 0.65 (0.59 for adolescent men and 0.65 for adolescent women) to 0.75 (0.71 for adolescent men and 0.75 for adolescent women), similar to other scales assessing sexual self-efficacy within sub-Saharan African settings (93, 106, 180, 184, 192, 206, 208, 239).

Explanatory Covariates

Socio-demographic characteristics

Explanatory variables included age (≤15 versus 16-17 versus 18-19), sexual orientation (heterosexual versus gay/lesbian, bisexual or other), currently in school, housing type (shack versus reconstruction and development programme [RDP] house, flat or brick house [rented or owned], hostel or other), adult caregiver living in the home. Relationships status was assessed by asking participants if they have had a boyfriend or girlfriend in the last 6 months (L6M), number of current boyfriends or girlfriends (none versus one versus ≥ two), as well as if their boyfriend/girlfriend was 5 or more years older than them (no versus yes versus no boyfriend/girlfriend in last 6 months (L6M).

Food Security

Categories of low versus medium and high food security is based off of Kendall, Olson & Frongillo's 1995 9-item validation of the Radimer/Cornell's measure of hunger and food insecurity (240, 241). Questions included whether participants identified "never", "rarely", "sometimes" or "often" worrying that their household would have enough food in the last 30 days (study alpha = 0.81) (241).

HIV Knowledge

HIV knowledge was determined as a percentage of correct responses to Carey and Schroder's 2002 18-item HIV knowledge test where participants were asked to answer true and false questions regarding HIV such as "*A person can get HIV by sharing a glass of water with someone who has HIV*" (study alpha= 0.57) (242).

Condom use beliefs and sexual beliefs

Two principal component analyses (PCA) were conducted to determine patterns in survey item responses related to participants' beliefs and attitude's about sexual activities, including specific questions relating to condom use that to our knowledge have not been previously validated within the context of South Africa (180). In the first PCA, 6-items were all highly loaded on a single component resulting in one 6-item factor (all loading > 0.60). Participants were asked to read statements regarding condom use (e.g. "Condoms are safe to use") and state how much they agreed or disagreed with the items. For the purpose of this analysis this 6-item scale will be referred to as the "Positive Condom Use Belief Scale" (PCBS) (range= 6-30, Cronbach alpha= 0.86) with

higher scores indicating more positive condom use beliefs). In the second PCA, 21 items around sexual beliefs (e.g. “it is ok to pressure someone into having sex when they do not want to”) were entered into the analysis (overall Cronbach alpha= 0.70). 7 items were removed as their correlation loadings on the principle component were below 0.30, and the remaining 14-items showed an improved internal consistency (Cronbach alpha=0.77, range=0-14, with higher scores indicating lower potentially harmful sexual relationship beliefs). For this study the 14-item scale will be referred to as the “SRBS”. Individual items and PCA test results for the PCBS and SRBS presented in **Appendix D**

Substance use and violence variables

Participants were asked about illicit drug consumption (excluding marijuana) in last 6 months. History of physical violence was measured by participants’ report of ever experiencing physical violence.

Probable depression was determined using the 20-point Centre for Epidemiological Studies Depression (CES-D) Scale (study alpha=0.81, range 0-60, with higher scores indicating greater depression symptomology) (243). Based off of previous work conducted among adolescents, (244) a higher CES-D cut off of 24 or higher was use to determine probable depression within our sample.

3.4.3 Statistical Analysis

All analyses were conducted using SAS 9.4, stratified by gender (men versus women). No participants identified as transgendered. Differences in demographic variables and covariates of SSE scores were compared by gender using Wilcoxon rank sum test for continuous variables and Pearson χ^2 or Fisher’s exact test for categorical variables. Univariable and multivariable logistic regression were used to identify variables associated with high-SSE versus low-SSE separately for adolescent men and adolescent women. Multivariable models were built using backward selection entering all variables with univariable p-values of <0.20. Model selections were based on Type III p-values to reach the optimal (minimized) AIC (245). All statistical tests were considered significant at $\alpha<0.05$.

3.5 Results

Of the 830 adolescents, 9.3% (44 men and 45 women) were excluded due to incomplete sexual self-efficacy (SSE) data, yielding a final sample of 741 (89%).

Median age was 17 years (Q1-Q3=16-18). Overall, 12.5% of men and 17.4% of women identified as gay, bisexual or other sexual minority. Adolescent men were more likely to report ever having had sex (64.3% versus 50.5%; p<0.001). A majority reported having a boyfriend/girlfriend in the L6M (80.4% of men and 75.6% of women), with 17% of adolescent women reporting a boyfriend who was at least 5 years older, versus 3% of adolescent men. Approximately half of participants reported low food security. Median Sexual Relationship Belief Scale (SRBS) scores were significantly lower among men (12 [IQR:10-13], versus. 13 [IQR:12-14] for women; (p<0.001)). Men were significantly more likely to have used drugs (9.3% versus 2.8%), whereas women were significantly more likely to have high scores on the HIV knowledge test (78.0% versus. 72.0%) (**Table 1**).

Adolescent women were significantly more likely to have high-SSE compared to young men (72.3% versus 49.5%, p<0.001, respectively) (**Table 2**). By scale item, women felt more confident they could refuse sex anytime they didn't want it (69.5% versus 42.8%, p<0.001), refuse sex if their partner did not want to use a condom (56.0% versus 34.9%, p<0.001) communicate with their partners about condom use (83.0% versus 74.6%, p=0.005), and communicate with partners about previous sexual partners (68.8% versus 58.5%, p<0.001),

In unadjusted analyses, high-SSE among men was significantly associated with higher SRBS scores (OR=1.15, 95%CI= 1.05-1.27), and inversely associated with reports of using drugs in the last 6 months (L6M) (OR=0.36, 95%CI=0.15-0.83) and having a girlfriend ≥5 years older (OR=0.11, 95%CI=0.01-0.87) (**Table 3**). High-SSE among women was significantly associated with high/medium food security (OR=1.59, 95%CI=1.04-2.44), and inversely associated with living in a shack (OR=0.46, 95%CI=0.27-0.80), using drugs in L6M (OR=0.26, 95%CI=0.08-0.84) and having a boyfriend ≥5 years older than them in the L6M (OR=0.49, 95%CI=0.28-0.86), More sexually inexperienced adolescent women had high-SSE compared to those who are sexually experienced (57.1% versus 47.9%), although this was not statistically significant (OR=0.60, 95%CI=0.45-1.06) (**Table 4**).

In adjusted analyses, among men, high-SSE was independently associated with higher SRBS (aOR=1.15, 95%CI=1.05-1.27) and inversely associated with probable depression (aOR=0.57, 95%CI=0.35-0.95). For women, high-SSE was positively associated with having had an adult caregiver living in the home (aOR=2.08, 95%CI=1.06-4.05), having higher HIV knowledge, (aOR=1.33 per 10% increase, 95%CI=1.10-1.61), PCBS scores (aOR=1.08, 95%CI=1.03-1.14), and SRBS scores (aOR=1.09, 95%CI= 1.03-1.15), while inversely associated with being 16-17 years of age compared to 14-15 years (aOR=0.43, 95%CI=0.22-0.87), and ever experiencing physical violence (aOR=0.60, 95%CI= 0.37-0.97) (**Table 5).**

3.6 Discussion

Among this large sample of adolescents living in Soweto, South Africa, we found significant gender differences in the prevalence and correlates of high- sexual self-efficacy. Consistent with other HIV prevention studies conducted within sub-Saharan Africa adolescent women had significantly higher levels of SSE than men (90, 106, 179). Our findings further highlight that beyond individual beliefs and determinants of SSE outlined within Bandura's theory, a number of socio-structural factors are associated with high-SSE, including reduced experiences of violence and having an adult caregiver in the home.

Compared to a national representative sample of sexually active South African adolescents, we found that adolescents in our study had lower confidence in their ability to talk to their partners about condom use and refuse sex anytime they didn't want to (106). This may be indicative of the unique experiences, including high levels of violence, poverty and poor access to quality sexual education, faced by youth growing up in peri-urban settings such as Soweto (246-248).

Given the gendered epidemic in South Africa, much HIV prevention efforts have been targeted towards young women (50, 249). Thus, it is not surprising that adolescent women in our study had higher SSE compared to men (215). Higher SSE found among adolescent women in our study may be explained by younger- aged adolescent women having stronger communication skills and more knowledge around HIV transmission compared to their male peers (215). Disparities in SSE is concerning, as lower SSE among adolescent men was associated with factors that increase vulnerability to HIV-

transmission, including more harmful sexual beliefs (e.g. it is ok to hit your boyfriend/girlfriend when you are angry with them) and probable depression. Moreover, compared to adolescent women, men had more negative beliefs about condom use and knew less about HIV transmission. Thus, in order to address gendered gaps in SSE within settings such as Soweto, it is imperative to shift harmful gender roles and norms, support mental health, and improve sexual communication skills within gender-sensitive comprehensive HIV prevention and educational interventions (71, 249).

Over half of adolescent women our study reported experiencing physical violence, which was associated with lower SSE, aligning with previous South African studies indicating an important mediating factor between SSE and HIV risk reduction, such as condom negotiation (137). This may be particularly important within intergenerational relationships (158), which was associated with lower SSE at the univariate level. In line with Bandura's theory and South African evidence, we found having an adult caregiver in the home to be associated with higher SSE, potentially indicating that positive familial modeling is important for developing self-efficacy, and simultaneously provides opportunities for increased sexual communication, sexual health knowledge, condom negotiation and delayed sexual initiation (63, 75, 206). However, data utilized within BBAHS cannot predict the quality of the relationship between adult caregivers and adolescents, indicating an important area for future research and potential point for intervention.

Through the inclusion of a number of factors that may impact the development of SSE, the theoretically-informed methods in this analysis add to existing literature examining SSE among adolescent men and women in South Africa. Our study purposefully included sexual experienced and inexperienced adolescent men and women, and the findings add to an important body of research examining the gendered differences in sexual beliefs, attitudes and agency among adolescents in the critical transitional period of initiating and engaging in sexual relationships within an HIV hyper-endemic settings of Soweto.

There are, however, limitations to this study. As the data were cross-sectional, neither directionality of associations nor causality can be determined. Data were based on self-report, which may be subject to recall and social desirability bias, due to the sensitive nature of several questions. Readers should also note that for those not in a

relationship and who have not yet initiated sexual activity the responses to the SSE scale would have been hypothetical. Furthermore, constructs of SSE were developed in Western settings (84), and thus may not be applicable to South African adolescents. However, dichotomizing scores yielded improved internal consistency for SSE scales. Future studies may want to consider this finding when developing questionnaires and scales to assess psychosocial constructs such as self-efficacy among adolescents.

Adolescents, and particularly adolescents women, remain the most vulnerable group for HIV acquisition within South Africa, thus it is imperative that research examine the multiple-intersecting factors that affect HIV-risk and sexual health outcomes (57). For adolescent men in our study, findings align with previous South African studies, and psychosocial theoretical frameworks of behaviour suggesting that those who are able to challenge negative sexual relationship beliefs and have reduced emotional distress may have increased confidence to engage in risk-reduction behaviour (63, 200). Our data highlights that perhaps boys have been left behind within HIV prevention and educational efforts. As young men are and will become the sexual partners of young women, it is imperative to scale up in efforts that promote HIV knowledge, and address harmful sexual relationship beliefs, so as to promote more equal relational contexts which allow for safe sexual negotiation to take place (249). For adolescent women socio-structural predictors of SSE highlight that despite high levels of SSE reported by adolescent women in our study, in order for women to safely enact personal agency within their sexual relationships, efforts are needed to reduce acts of violence and promote positive family dynamics early in adolescence.

Table 3-1 Socio-demographic, HIV and sexual behaviour, and substance use characteristics of adolescents (aged 14-19 years) by gender (n=741)

	Men (n=311)		Women (n=430)		P-value
	n	(%)	*n*	(%)	
Age (median Q1, Q3)	*17*	*16, 18*	*18*	*16, 18*	*0.161*
Age Categories					
≤15	74	24.3	82	19.2	0.239
16-17	86	28.2	123	28.8	
18-19	145	47.5	222	52.0	
HIV Knowledge (median % score, Q1, Q3)	*72%*	*61, 83*	*78%*	*67, 89*	*<0.001*
Positive Condom Belief Score (median Q1, Q3)	*24*	*22, 27*	*24*	*23, 28*	*0.077*
Sexual Relationship Belief Score (median Q1, Q3)	*12*	*10, 14*	*13*	*12, 14*	*<0.001*
Sexual Orientation					
Straight	272	87.5	355	82.6	0.068
Gay, bisexual, lesbian (LGB) or other	39	12.5	75	17.4	
Currently in School					
Yes	258	83.0	370	86.9	0.141
No	53	17.0	56	13.2	
Housing Type (shack)					
No	269	86.5	366	85.1	0.597
Yes	42	13.5	64	14.9	
Adult at Home					
No	43	14.1	59	13.9	0.948
Yes	263	86.0	366	86.1	
Boyfriend/Girlfriend in the last 6 months (L6M)					
No	61	19.6	104	24.4	0.127
Yes	250	80.4	323	75.6	
Number of Current Boyfriend/Girlfriend					
None	96	31.6	158	37.4	<0.001
One	113	37.2	229	54.1	
Two or more	95	31.3	36	8.5	
Boyfriend/Girlfriend ≥5 years older in the L6M					

No	229	76.3	248	58.8	<0.001
Yes	10	3.3	70	16.6	
No Boyfriend/girlfriend in L6M	61	20.3	104	24.6	
Physical Violence Ever					
No	128	41.2	191	44.4	0.376
Yes	183	58.8	239	55.6	
Food Security					
Low	167	53.7	211	49.3	0.238
Medium/High	144	46.3	217	50.7	
Sex Ever					
No	111	35.7	213	49.5	<0.001
Yes	200	64.3	217	50.5	
Sex in L6M					
No	72	37.3	70	32.7	0.331
Yes	121	62.7	144	67.3	
Age at First Sex					
Younger than 15	74	42.8	13	7.0	<0.001
15 or older	99	57.2	173	93.0	
Drug Use in L6M					
No	282	90.7	418	97.2	<0.001
Yes	29	9.3	12	2.8	
Probable Depression (CES-D≥24)					
No	216	69.9	268	63.2	0.059
Yes	93	30.1	156	36.8	

Note: P-values in **Bold** are significant,

Italicized results are median Q1, Q3

Table 3-2 High versus Low Sexual Self-efficacy and individual scale items among adolescents (aged 14-19) in BBAHS by gender (n=767)

	Men (n=311)		Women (n=430)		P-value
	n	%	n	%	χ^2 test
Sexual Self-Efficacy median Q1,Q3)	3	2, 5	5	3, 6	
Low (≤3)	157	50.5	119	27.7	<0.001
High (>3)	154	49.5	311	72.3	
Would you be able to...					
... avoid sex any time you didn't want it					
No, Probably No, Probably Yes	178	57.2	131	30.5	<0.001
Yes	133	42.8	299	69.5	
... talk to your partner about his/her previous sexual activities					
No, Probably No, Probably Yes	129	41.5	134	31.2	0.004
Yes	182	58.5	296	68.8	
... use a condom every time you have sex					
No, Probably No, Probably Yes	108	34.7	111	25.8	0.009
Yes	203	65.3	319	74.2	
... use a condom during sex after you have been drinking or taking drugs					
No, Probably No, Probably Yes	162	52.1	164	38.1	<0.001
Yes	149	47.9	266	61.9	
... have sex without condom					
No, Probably No, Probably Yes	174	56.0	150	34.9	<0.001
Yes	137	44.1	280	65.1	
... talk about using condoms with your partner					
No, Probably No, Probably Yes	79	25.4	73	17.0	0.005
Yes	232	74.6	357	83.0	

Table 3-3 Univariable and adjusted analysis of variables associated with high versus low SSE among South African adolescent men (aged 14-19) enrolled in BBAHS (n=311)

	Low self-efficacy		High Self-Efficacy		OR (95%CI)
	n	%	*n*	%	
Age (median Q1, Q3)	*17*	*16, 18*	*18*	*16, 18*	*1.08 (0.94-1.25)*
Age Categories					
≤15	38	24.8	36	23.7	1.00
16-17	50	32.7	36	23.7	0.76 (0.41-1.42)
17-18	65	42.5	80	52.6	1.30 (0.74-2.28)
HIV-knowledge scale (median % Q1, Q3)	*72%*	*61, 78*	*72%*	*61, 83*	*1.12 (0.97-1.31)*
Positive Condom Belief Score (α=0.8631, median Q1, Q3)	*24*	*22, 28*	*24*	*22, 27*	*1.02 (0.97-1.07)*
Sexual Relationship Belief Score (α=0.7736, median Q1, Q3)	*11*	*9, 14*	*12*	*11, 14*	*1.18 (1.08- 1.28)*
Housing type (shack)					
No	137	87.3	132	85.7	1.00
Yes	20	12.7	22	14.3	1.14 (0.60-2.19)
Adult at Home					
No	22	14.5	21	13.6	1.00
Yes	130	85.5	133	86.4	1.07 (0.56-2.04)
Current in School					
Yes	132	84.1	126	81.8	1.00
No	25	15.9	28	18.2	1.17 (0.65-2.12)
Experienced physical violence					
Ever	61	38.9	67	43.5	1.00
Never	96	61.2	87	56.5	0.83 (0.53-1.30)
Food Security					
Low	90	57.3	77	50.0	1.00
Medium/High	67	42.7	77	50.0	1.34 (0.86-2.10)
Boyfriend/Girlfriend ≥5 years older in the L6M					
No	113	75.3	116	77.3	1.00
Yes	9	6.0	1	0.7	0.11 (0.01-0.87)
No Boyfriend/girlfriend in the L6M	28	18.7	33	22.0	1.15 (0.65-2.02)
Sex Ever					

	Low self-efficacy		High Self-Efficacy		OR (95%CI)
	n	%	*n*	%	
No	56	35.7	55	35.7	1.00
Yes	101	64.3	99	64.3	1.00 (0.63-1.59)
Used Drugs in the L6M					
No	136	86.6	146	94.8	1.00
Yes	21	13.4	8	5.2	**0.36 (0.15-0.83)**
Probable Depression					
No	98	63.2	118	76.6	1.00
Yes (score ≥ 24)	57	36.8	36	23.4	**0.53 (0.35-0.95)**

Bolded text indicates statistical significance in adjusted model at $p<0.05$

Table 3-4 Univariable and adjusted analysis of variables associated with high versus low SSE among South African adolescent women (aged 14-19) enrolled in BBAHS (n=430)

	Low self-efficacy		High Self-Efficacy		OR (95%CI)
	n	(%)	*n*	(%)	
Age (median Q1, Q3)	*17*	*15, 18*	*18*	*16, 18*	*1.06 (0.93-1.22)*
Age Categories					
≤15	20	17.1	62	20.0	1.00
16-17	44	37.6	79	25.5	0.43 (0.22-0.87)
18-19	53	45.3	169	54.5	0.73 (0.37-1.42)
HIV-knowledge scale (median % Q1, Q3)	72%	61, 83	78%	72, 89	*1.43 (1.21-1.68)*
Positive Condom Belief Score (median Q1,Q3)	24	22, 27	24	24, 28	*1.10 (1.05-1.15)*
Sexual Relationship Belief Score (median Q1,Q3)	12	10-14	13	12-14	*1.31 (1.17-1.45)*
Housing type (shack)					
No	92	77.3	274	88.1	1.00
Yes	27	22.7	37	11.9	0.46 (0.27-0.80)
Adult at Home					
No	28	23.9	31	10.1	1.00
Yes	89	76.1	277	89.9	2.81(1.60-4.95)
Currently in School					
Yes	65	56.5	203	65.7	1.00
No	50	43.5	106	34.3	0.68 (0.44-1.05)
Ever experienced physical violence					
Ever	42	35.3	149	47.9	1.00
Never	77	64.7	162	52.1	0.59 (0.38-0.92)
Food Security					
Low	68	57.6	143	46.1	1.00
Medium/High	50	42.4	167	53.9	1.59 (1.04-2.44)
Boyfriend/Girlfriend ≥5 years older in the L6M					
No	61	53.0	187	60.9	1.00
Yes	28	24.4	42	13.7	0.49 (0.28-0.86)

No Boyfriend/girlfriend in the L6M	26	22.6	78	25.4	0.98(0.58-1.66)
Sex Ever					
No	51	42.9	162	52.1	1.00
Yes	68	57.1	149	47.9	0.69 (0.45-1.06)
Drug Use in L6M					
No	112	94.1	306	98.4	1.00
Yes	7	5.9	5	1.6	**0.26 (0.08-0.84)**
Probable Depression					
No	65	56.5	203	65.7	1.00
Yes	50	43.5	106	34.3	0.68 (0.44-1.05)

Bolded text indicates statistical significance in adjusted model at $p<0.05$

Table 3-5 Multivariable models of factors associated with high versus low SSE among adolescent men and women (aged 14-19)

	Men: Multivariable			Women: Multivariable		
Sexual Self-Efficacy	aOR	95% CI		aOR	95% CI	
Age Categories						
≤15				1.00		
16-17				0.43	0.22	0.87
18-19				0.73	0.37	1.42
HIV Knowledge 18Qs (median % Q1, Q3)				*1.33*	*1.10*	*1.61*
Positive Condom Belief Score (median Q1, Q3)				*1.08*	*1.03*	*1.14*
Sexual Relation Belief Score (median Q1,Q3)	*1.15*	*1.05*	*1.27*	*1.19*	*1.08*	*2.07*
Adult at Home						
No				1.00		
Yes				2.06	1.06	4.01
Ever Experienced Physical Violence						
No				1.00		
Yes				0.60	0.37	0.97
Probable Depression						
No	1.00					
Yes	0.57	0.35	0.95			

Bolded text indicates statistical significance in adjusted model at p<0.05

Chapter 4. Sexual Self-Efficacy and Consistent Condom Use among Adolescent Men and Women Living in Soweto, South Africa

4.1 Abstract

Sexual self-efficacy (SSE), one's perceived control over sexual behaviour, has been associated with HIV prevention behaviours. Few studies, however, have examined gendered differences in this association among adolescents in HIV-endemic settings.

Using cross-sectional questionnaire data from sexually-experienced adolescents (aged 14-19) in Soweto, South Africa, we measured SSE using a 6-item scale (e.g. I would be able to use a condom every time I had sex; range: 0-6) with 'high-SSE'= score>3 (study alpha=0.75). Gender-stratified confounding logistic regression models assessed associations between high-SSE and consistent condom use (defined as condom use during every vaginal/anal sexual act).

Of 830 participants (median age=18; 60% female), 50.2% (n=417) reported ever having sex. Men were more likely to report >2 current partners (45.3%) than women (9.1, p<0.001), while women more likely to report having a partner ≥5 years older (32.6%) versus 5.4% of men (p<0.001). A higher proportion of women than men had high-SSE (68.7% versus 49.5%, p<0.001). We observed no difference in the prevalence of consistent condom use by gender (45.5% among women vs 45.8% among men; p=0.943).

In confounder models adjusting for physical violence among men and age, adult caregiver at home, food security, and probable depression among women, high-SSE was associated with consistent condom use among men (aOR=3.51, 95%CI=1.86-6.64), but not women (aOR=1.43, 95%CI=0.74-2.77).

Given high-sustained HIV incidence among adolescent women in South Africa, results underscore a need to move beyond individual-level indicators of male condom use. Rather, we must consider how relationship dynamics and gender-power inequities, shape sexual decision-making and HIV risk.

4.2 Introduction

New infections within South Africa- the country with the highest absolute number of people living with HIV globally- continue to disproportionately affect adolescent and young women aged 15 to 24 (15, 110). In 2012, incidence rates among women aged 15 to 24 were 4 times higher than men in the same age category (2.54% versus 0.55%) (37). High sustained HIV incidence among adolescent women combined with reductions in the uptake and use of male condoms within South Africa call for a critical examination of the gendered determinants of HIV acquisition (37, 156, 174, 186, 250).

The construct of sexual self-efficacy (SSE) assesses the confidence or perceived control that an individual has in performing a given sexual behaviour including condom use negotiation, partner communication and refusal of unwanted sex. Despite criticisms of SSE as a largely western concept emphasizing independent over collective decision-making (92), SSE has been commonly used within HIV preventative studies to measure and examine sexual decision-making (63, 85, 251, 252). Historically, studies examining psychosocial constructs of decision-making and behaviour, such as SSE, have failed to examine larger socio-structural and relationship level factors that may influence the ability for adolescents to move from perceived control into action. For example, sexual decision-making is a didactic and gendered process, yet relatively few HIV prevention studies within HIV hyper-endemic settings such as South Africa have considered gendered pathways to HIV risk in the translation of SSE into sexual behaviour including consistent condom use and refusal of unwanted sex (202, 253, 254).

Cross-sectionally evidence within HIV preventative studies conducted among adolescents in sub-Saharan Africa have found an association between high-SSE and consistent condom use (174, 180, 182, 185), while others have found no association (181, 187, 255). Many of these studies, however fail to consider gender despite condom use being a systematically gendered experience. Within behavioural intervention studies, few have demonstrated that higher SSE translates into sexual behaviour change (204, 207, 209, 211), and none to date have demonstrating reduced HIV incidence (57, 221, 256). Moreover, gender differences in the relationship between SSE and consistent condom use indicate that higher SSE may predict increased consistent condom use among adolescent men but not among adolescent women (200, 209). Such gendered effects may be due to broader individual, dyadic, and socio-structural factors

that influence sexual behaviours (e.g., experiences of violence, relationship dynamics, gender-power inequities, and social and cultural norms, mental and emotional health), which create syndemic HIV risk for adolescent women (50, 107, 108, 123, 139, 257, 258).

Due to the lack of gender segregated research and inconclusive evidence regarding the construct of SSE as a determinant of consistent condom use among adolescent women and men within HIV hyper-endemic settings such as South Africa, we examined the association between high-SSE and consistent condom use by gender.

4.3 Methods

4.3.1 Study Design

The Botsha Bophelo Adolescent Health Study (BBAHS) is a cross-sectional interview administered socio-behavioural and SRH questionnaire that was conducted among 830 adolescents between 2010 and 2012 within Soweto, South Africa. Previous research in Soweto found that among young adults aged 15 and above, HIV prevalence was around 3.7%, with adolescent women significantly more likely to be living with HIV compared to their male counterparts (4% versus 2%, $P<0.001$) (30). The BBAHS study has been previously described in this thesis (108, 259).

4.3.2 Participants

Participants for BBAHS were recruited from 41 townships within Soweto and were eligible to participate if they were between the age of 14 and 19 at the time of enrolment. Participants were recruited through word of mouth and outreach at different locations frequented by adolescents (e.g. community centres, neighbourhood parks, recreation centres and schools) as identified by the study team. Community-level sampling allowed for BBAHS to consist of adolescents out-of school, a population frequently excluded from HIV prevention research (36). Given a higher burden of HIV among young women, BBAHS aimed to recruit a sample including 40% adolescent men and 60% adolescent women.

As the main outcome of interest for this analysis was to examine the relationship between SSE and consistent condom use, we restricted the analysis to adolescents who reported a history of sexual activity (sexually experienced), which was assessed by asking participants if they have ever had sexual (vaginal/anal) intercourse.

4.3.3 Ethical Considerations

The study team collected informed consent from participants over the age of 18 and parental and adolescents under 18 signed an informed assent consent form and provided signed parental consent. BBAHS received ethical approval from the University of the Witswatersrand in Johannesburg, South Africa (M090449) and Simon Fraser University in Burnaby Canada (2009s0196). As part of this Master's thesis project, this analysis also received ethical approval from the University of British Columbia providence health care (UBC-PHC) research institute (UBC-PHC REB number: H16-00497).

4.3.4 Data Collection

BBAHS questionnaires were completed by participants during 45-60 minute interviews with local trained interviewers who spoke multiple local languages including English, Zulu and Setswana. Participants were given 50 ZAR (approximately 7 USD at the time) as compensation for their time and transportation to the PHRU or KMAC where interviews took place. Responses were entered manually by interviewers using Survey Monkey, an online survey administration software (128). Questionnaires administered in Zulu were translated into Zulu from English and then back translated to ensure accuracy.

4.3.5 Measures

Outcome Variable: Lifetime Consistent Condom Use

Participants were coded as lifetime consistent condom users if they answered "Always" to the question "*How often did you use a condom when having consensual vaginal/anal sex in your life time*". Participants who preferred not to answer the question, were not included within the multivariate model.

Exposure of interest: Sexual Self-efficacy (SSE)

The primary exposure of interest was sexual self-efficacy (SSE). The SSE scale used within this thesis has been described in **Chapter 3**. Although self-efficacy questions were asked regarding perceived control within a relationship, all participants were asked the questions. Moreover, the questions did not specify what partner to think of when responding if the participant identified as having more than one partner. **Table 4.2** presents gender-stratified responses from sexually experienced participants to all six items included within the SSE scale.

Potential Confounders

In examining the relationship between high-SSE and consistent condom use we assessed potential confounders stratified by gender. No participants identified as transgender. Confounding factors were selected based off the literature, available data, and a priori knowledge of important determinants of consistent condom use within the context of South Africa.

Socio-demographic Characteristics including Age (in years), education status (currently in school), and adult caregiver in the home.

Relationship Dynamics: Relationship dynamics of sexually experienced participants assessed as whether participants had a boyfriend or girlfriend in the last 6 months (yes versus no) and among those who have, number of current boyfriends/girlfriends (none versus one versus two or more), if their boyfriend/girlfriend was ≤5 years younger than them, of if their boyfriend/girlfriend ≥5 years older than them. Among those who had sex in the last 6 months we also adjusted for a measure of relationship control which was determined by asking participants if their partner always controls condom use or sex (always versus sometimes or unsure).

Sexual behaviours were controlled for including: current sexual activity (defined as having had sex in the last 6 months), and age at first sex (younger than 15 versus older than 15). Participants were also asked whether they ever had difficulty accessing condoms.

Mental health and experiences of violence*:* Depressive symptoms were assessed using the 20-point Centre for Epidemiological Studies Depression (CES-D) Scale (study

alpha=0.81, range 0-60, with higher scores indicating greater depression symptomology) (243). Among adults, a cut-off point of 16 or higher is typically used to determine major depressive disorder (260). Based off of previous work among adolescents, we chose a cut-off of 24 or higher which has been previously determined to be the best cut-off for probable depression for adolescents (244).

Participants who responded “yes” to either of the following questions were coded as ever experiencing physical violence: “Have you ever experienced an act of violence, not by someone in your family, such as being attacked, shot at, stabbed, beaten, or robbed?” or “Sometimes kids are hurt by people in their own family, such as being punched, kicked, choked, or thrown down hard. Have you ever experienced being hurt by a member of your family?”

4.3.6 Statistical Analysis

All analyses were conducted using SAS 9.4, stratified by gender (adolescent men versus women). Differences in demographic variables and covariates of SSE scores were compared by gender among sexually experienced adolescents within BBAHS using Wilcoxon rank sum test for continuous variables and Pearson Chi square or Fisher’s exact test for categorical variables. Gender stratified univariable and multivariable regression models assessed the independent association between SSE and consistent condom use among sexually experienced adolescents. Participants were included within the univariable and multivariable analyses if they answered questions regarding consistent condom use as well as all the SSE items include within the questionnaire.

4.4 Results

Of the 830 adolescent, 417 (50.2%) had ever had sexual intercourse, including 200 adolescent men (48.0%) and 217 adolescent women (52.0%) and were included in this analysis.

The median age of participants was 18 (Q1, Q3= 17-18) for both adolescent men and women. Compared to sexually experienced adolescent women, adolescent men

were significantly more likely to have two or more girlfriend/boyfriends in the last 6 months (L6M), to have had sex for the first time before the age of 15 (43.5% for adolescent men versus 6.7% for adolescent women, p<0.001), and to report difficulty acquiring condoms in L6M (42.7% for adolescent men versus 15.3% for adolescent women). No statistical significant gender difference was found in lifetime consistent condom use among sexually experienced adolescents (45.7% for young men versus 46.3% for young women, p=0.943). Among those who reported sexual activity in the last 6 months (n=265), adolescent men were more likely to report that their sexual partners always controlled sex or condoms (31.9% for adolescent men versus 20.3% of adolescent women, p=0.005). Among the 366 participants (87.8%) reported having a boyfriend or girlfriend in the L6M, 61 (32,6%) adolescent women and 9 (5.4%) adolescent men reported that their partner was much older (>5 years) (p<0.001, for gender differences)) (**Table 4.1**).

A higher proportion of women had high-SSE (68.7%) compared with men (49.5%; p<0.001). Differences in SSE between men and women were driven to responses to the following four individual items, where women were statistically more likely (p<0.05) to report that they could probably avoid sex any time they didn't want to, talk to their partner about his/her previous sexual activities, use a condom during sex after they have been drinking or taking drugs, and refuse to have sex without a condom (**Table 4.2**). No gender differences were found between men and women's confidence in their ability to use a condom every time they had sex (p=0.226).

Univariable and multivariable results

Table 4.3 (n=187). Among men, univariable analyses shows consistent condom use was associated with high-SSE (OR=2.84, 95%CI 1.57-5.16). Additional factors associated with consistent condom use included older age (OR=1.41 per year, 95%CI=1.10-1.81), and ever experiencing physical violence (OR=2.00, 95%CI=1.07-3.75). Consistent condom use was negatively associated with having had sex for the first time before the age of 15 (OR=0.40, 95%CI=0.21-0.75). **In multivariable confounding model,** consistent condom use was independently associated with high-SSE (aOR=3.51, 95%CI: 1.86-6.64), adjusted for experiencing physical violence. Results further found that 74% of men with low-SSE reported ever experiencing physical violence, compared to 57.9% of those with high-SSE (p<0.001). (Data not shown).

Table 4.4 (n=203). Among women, univariable analyses shows no statistically significant association between high SSE and consistent condom use (aOR=1.74, 95%CI=0.94-3.20), while younger age (OR=0.71 per year, 95%CI=0.53-0.97) and probable depression (OR=0.46, 95%CI=0.25-0.83) was inversely associated with consistent condom use. In multivariable confounding model, there remained no statistically significant association between high-SSE and consistent condom use (aOR=1.43, 95%CI=0.74-2.77), adjusted for age, food security, adult caregiver at home and probable depression.

4.5 Discussion

Our findings reveal that after controlling for experiencing physical violence the relationship between high-SSE and consistent condom use was strengthened for adolescent men. At both univariable and multivariable levels the relationship between high-SSE and consistent condom use was not significant. Among adolescent women, our results revealed that factors such as positive mental health and younger age may be more important for predicting consistent condom use than high-SSE. Although previous South African studies have found an association between depression and consistent condom use (107, 108), to the best of our knowledge the relationship between depression, high-SSE and consistent condom use has not been previously described in this context.

Our results reveal that nearly half (45.3%) of sexually experienced adolescent men reported having two or more current partners compared with only 9% of adolescent women. Moreover, nearly half (42.7%) of sexually active men reported difficulty acquiring condoms compared to only 15% of adolescent women. Despite the differences in relationship concurrency and perceived access to condoms this study found no gender differences in reporting of condom use. Condom use among women was found to decrease with age, which aligns with previous South African data (37, 174). Decreased condom use with age among a sample of adolescent women reporting mainly one boyfriend may be due to an increase in intimacy and trust as sexual relationships develop and the perceived need for HIV prevention practices declines (66, 186). Within the context of South Africa, condom negotiation scripts that are accepted

within adolescents' relationships may be more influenced by collective gender roles and social norms than individuals' perceived agency in decision-making (97, 229). With age, these sexual decision-making scripts become more engrained likely influencing reductions in consistent condom use.

For adolescent women in our study, higher depressive symptomology was more predictive of consistent condom use than SSE. This aligns with previous studies that have found that symptoms of depression are common and associated with syndemics that mutually reinforce adolescent women's risk of acquiring HIV, through a number of pathways that reduce agency in safe sex negotiation, including increased vulnerability to relationships marked with relationship power inequity and high levels of IPV (107, 261, 262). Beyond increased susceptibility to abusive relationships, depressive symptoms may be increased within these relationships (263). Increased depression within sexual relationships may heighten feelings of low self-worth and perhaps increase unprotected sex to please sexual partners, in turn helping young women to cope with negative emotions (25, 107). Thus, despite high behavioural intentions to use condoms among adolescent women, our findings highlight a syndemic between depression and HIV risk that merit future research and gender-sensitive interventions that begin early (258)

Over half of adolescent men and women (65% for both) within our sample reported experiencing some form of physical violence in the community (e.g. shot at, stabbed) or by a family member (e.g. punched kicked, chocked). Among adolescent men, we found an unexpected association between experiencing physical violence and consistent condom use, where adolescent men who have reported experiencing physical violence were more likely to use condoms. Furthermore, after controlling for having ever experienced violence the relationship between SSE and consistent condom use was strengthened. Findings also revealed that adolescent men who have experienced violence were more likely to have low-SSE, highlighting the important impact that interpersonal trauma has on the sexual decision-making processes of young men growing up in peri-urban settings, such as Soweto (219, 261) To our knowledge the relationship between adolescent men experiencing violence and HIV risk prevention behaviours such as condom use has not been widely explored. The majority of research examining the link between violence and condom use among adolescent men indicates that men who perpetuate violence are more likely to engage in risky sexual behaviour including inconsistent condom use, transactional sex and multiple partners (74, 133,

264-267). Few studies have examined the link between experiencing violence and sexual behaviour, thus warranting future research to explore our unexpected findings.

This analysis presents a unique contribution to the literature that assesses the gendered relationship between SSE and consistent condom use. There are however, some limitations that should be acknowledged, and readers should keep in mind that participants reporting more than one current relationship were not asked to think of which partner they should think about when responding, which may have differed between primary and secondary partnerships. The variables included within this analysis are limited in their ability to extrapolate on the important relationship dynamics (relationship length, level of intimacy, experiences and perpetuation of IPV) of adolescent men and women in our sample that are known to influence condom use (125, 139, 268). Future research should examine motivations behind sexual initiation, intimacy, and experiences of IPV and controlling behaviours, particularly among adolescent women within age-disparate partnerships who report high-SSE, yet this did not translate into heightened consistent condom use (123, 124, 219, 269, 270).

Limitations in the validity of the extrapolation of the data presented within this analysis may also be influenced by social desirability bias as well as contextual, cultural and gendered interpretations surrounding participants' responses to questions regarding condom use, SSE, as well as depressive symptomologies. Thus, although the SSE scale included in this analysis were found to have higher internal consistency than other South African studies (90, 106), we suggest that future research aim to explore the specific contexts in which western conceptual constructs such as self-efficacy are understood by adolescents living in HIV endemic settings such as South Africa (271). This may include using statistical and qualitative methods to enhance content and face validity of psychosocial scale development including gender segregated exploratory factor analyses. Moreover, our findings cannot demonstrate a causal pathway between high-SSE and consistent condom use, future studies should seek to examine the temporal relationship between high-SSE and consistent condom use.

4.6 Conclusion

We found that despite sexually experienced adolescent women having significantly higher SSE compared to men their own age, that this was not associated

with consistent condom use. High-SSE was however associated with consistent condom use for adolescent men, highlighting that gender-targeted behavioural interventions should aim to promote SSE among adolescent men. Interventions aimed at reducing HIV incidence among adolescent women living in settings such as Soweto who face a nearly three fold risk of HIV, need to begin early and move beyond individual-level condom negotiation self-efficacy messaging to expand to include key socio-structural and relational determinants of adolescent health, including addressing factors which perpetuate the syndemics of violence, depression and HIV.

Table 4-1 Bivariate gender differences among adolescents (aged 14-19) who have (n=417) initiated sexual activity

Gender	Men (200)		Women (217)		
	N	%	N	%	P-value
Main Exposure of interest 6-item Sexual Self-Efficacy dichotomized					
≤3	101	50.5	68	31.3	<.0001
>3	99	49.5	149	68.7	
Socio demographic characteristics					
Age median (Q1, Q3)	*18*	*17, 18*	*18*	*17, 18*	*0.240*
Current in School					
No	45	22.5	49	22.7	1.000
Yes	155	77.5	167	77.3	
Adult at Home					
No	32	16.4	26	12.1	0.256
Yes	163	83.6	189	87.9	
Sexual behaviour and relationship dynamics					
Boyfriend/Girlfriend in last 6 months (L6M)					
No	23	11.5	27	12.5	0.765
Yes	177	88.5	189	87.5	
Number of Boyfriends/girlfriends in L6M					
None	19	11.2	25	13.4	<.0001
One	74	43.5	145	77.5	
Two or more	77	45.3	17	9.1	
Boyfriend/Girlfriend ≤5 years younger in L6M					
No	165	98.2	187	100.0	0.105
Yes	3	1.8	0	0.0	
Boyfriend/Girlfriend ≥5 years older in L6M					
No	159	94.6	126	67.4	<.0001
Yes	9	5.4	61	32.6	
Lifetime Consistent Condom Use					
No	102	54.6	110	54.2	0.943
Yes	85	45.5	93	45.8	
First Sex Age					
15+	73	43.5	12	6.7	<.0001
<15	95	56.6	166	93.3	
Sexual Activity in the L6M					
No	72	37.3	70	32.7	0.331
Yes	121	62.7	144	67.3	
Difficulty getting condoms in the L6M					

Gender	Men (200)		Women (217)		
	N	%	N	%	P-value
No	63	57.3	116	84.7	**<.0001**
Yes	47	42.7	21	15.3	
Partner Controls Sex or Condom Use among sexually active**					
Always	38	31.9	29	20.3	**0.005**
Sometimes/Unsure	52	43.7	53	37.1	
Never	29	24.4	61	42.7	
Probable Depression					
No	140	70.4	133	62.2	0.096
Yes (CES score ≥ 24)	59	29.7	81	37.9	
Ever Experienced Physical Violence					
No	70	35.0	77	35.5	1.000
Yes	130	65.0	140	64.5	
Forced Sex Ever					
No	174	91.1	188	86.6	0.162
Yes	17	8.9	29	13.4	

Note: P-values in **bold** are significant (<.05)

Italicized items are continuous (median, Q1, Q3)

Abbreviations: Center for Epidemiologic Studies- Depression Scale (CES-D);

* Among those who reported having a boyfriend/girlfriend in the last 6 months (L6M)

**Among those reporting sexual activity in the last 6 months

Table 4-2 Individual Sexual Self-Efficacy Scale items among sexually experienced adolescents (aged 14-19) by gender (n=417)

	Men (n=200)		Women (n=217)		P-value
	n	%	n	%	χ^2 test
Would you be able to…					
… avoid sex any time you didn't want it					
No, Probably No, Probably Yes	113	56.5	67	30.9	<0.001
Yes	87	43.5	150	69.1	
… talk to your partner about his/her previous sexual activities					
No, Probably No, Probably Yes	80	40.0	58	26.7	0.004
Yes	120	60.0	159	73.3	
… use a condom every time you have sex					
No, Probably No, Probably Yes	72	36.0	66	30.4	0.226
Yes	128	64.0	151	69.6	
… use a condom during sex after you have been drinking or taking drugs					
No, Probably No, Probably Yes	104	52.0	90	41.5	0.031
Yes	96	48.0	127	58.5	
… refuse to have sex without condom					
No, Probably No, Probably Yes	114	57.0	87	40.1	0.001
Yes	86	43.0	130	59.9	
… talk about using condoms with your partner					
No, Probably No, Probably Yes	50	25.0	39	18.0	0.080
Yes	150	75.0	178	82.0	

Note: P-values in **bold** are significant (<.05)

Table 4-3 Univariable associations of consistent condom use among sexually experienced men (n=187)

	No (102)		Yes (85)		Univariable Logistic		
	N	%	N	%	OR	95% CI	
Main Exposure of interest							
6-item Self-Efficacy							
Low (≤3)	62	60.8	30	35.3	Ref		
High (>3)	40	39.2	55	64.7	2.84	1.57	5.16
Age Median Q1, Q3	*18*	*17, 18*	*18*	*17, 19*	*1.41*	*1.10*	*1.81*
Current in School							
No	25	24.5	19	22.4	Ref		
Yes	77	75.5	66	77.7	1.13	0.57	2.23
Adult at Home							
No	14	14.0	13	15.3	Ref		
Yes	86	86.0	72	84.7	0.90	0.40	2.04
Boyfriend/Girlfriend in L6M							
No	13	12.8	9	10.6	Ref		
Yes	89	87.3	76	89.4	1.23	0.50	3.04
Current Boyfriend/Girlfriend*							
None	10	11.8	7	9.3	Ref		
One	38	44.7	31	41.3	1.17	0.40	3.41
Two or more	37	43.5	37	49.3	1.43	0.49	4.15
Boyfriend/Girlfriend much Younger*							
No	83	96.5	73	100.0	NA		
Yes	3	3.5	0	0.0			
Boyfriend/Girlfriend much Older*							
No	80	93.0	70	95.9	Ref		
Yes	6	7.0	3	4.1	0.57	0.14	2.37
First Sex Age**							
15+	43	47.3	52	69.3	Ref		
<15	48	52.8	23	30.7	0.40	0.21	0.75
Sex in L6M**							
No	34	34.3	30	35.3	Ref		
Yes	65	65.7	55	64.7	0.96	0.52	1.76
Difficulty in Getting Condoms***							
No	30	51.7	33	63.5	Ref		
Yes	28	48.3	19	36.5	0.62	0.29	1.32
Partner Controls Sex or Condom Use***							
Always	20	31.3	17	31.5	Ref		
Sometimes/Unsure	28	43.8	24	44.4	1.01	0.43	2.35
Never	16	25.0	13	24.1	0.96	0.36	2.54

Probable Depression (alpha=0.81)							
No	68	67.3	63	74.1	Ref		
Yes (score ≥ 24)	33	32.7	22	25.9	0.72	0.38	1.36
Ever Experienced Physical Violence							
No	42	41.2	22	25.9	Ref		
Yes	60	58.8	63	74.1	2.00	1.07	3.75
Forced Sex Ever							
No	87	88.8	78	95.1	Ref		
Yes	11	11.2	4	4.9	0.41	0.12	1.33

Note: Odds Ratios in bold are significant (<.05)

Italicized items are continuous (median, Q1, Q3)

Abbreviations: Center for Epidemiologic Studies- Depression Scale (CES-D);

* Among those who reported having a boyfriend/girlfriend in the last 6 months (L6M)

**Among those reporting sexual activity ever

***Among those reporting sexual activity in the last 6 month

Table 4-4 Univariable associations of consistent condom use among sexually experienced women (n=203)

	Inconsistent Condom Use (110)		Consistent Condom Use (93)		Univariable Logistic Results		
	N	%	N	%	OR	95% CI	
Main Exposure of Interest							
6-item Self-Efficacy	*4*	*3, 6*	*5*	*4, 6*	*1.14*	*0.97*	*1.33*
6-item Self-Efficacy dichotomized							
Low (≤3)	40	36.4	23	24.7	Ref		
High (>3)	70	63.6	70	75.3	1.74	0.94	3.20
Age	*18*	*17, 19*	*18*	*17, 18*	*0.71*	*0.53*	*0.97*
Current in School							
No	23	21.1	25	26.9	Ref		
Yes	86	78.9	68	73.1	0.73	0.38	1.39
Adult at Home							
No	16	14.7	6	6.5	Ref		
Yes	93	85.3	86	93.5	2.46	0.92	6.58
Boyfriend/Girlfriend in P6M							
No	9	8.3	14	15.1	Ref		
Yes	100	91.7	79	85.0	0.51	0.21	1.23
Current Boyfriend/Girlfriend*							
None	15	15.0	7	9.1	Ref		
One	77	77.0	62	80.5	1.72	0.66	4.48
Two or more	8	8.0	8	10.4	2.14	0.57	8.06
Boyfriend/Girlfriend much Younger*							
No	99	100.0	79	100.0	NA		
Yes	0	0.0	0	0.0			
Boyfriend/Girlfriend much Older*							
No	65	65.7	56	70.9	Ref		
Yes	34	34.3	23	29.1	0.78	0.41	1.49
First Sex Age**							
15+	85	93.4	81	93.1	Ref		
<15	6	6.6	6	6.9	1.05	0.33	3.39
Sex in P6M**							
No	28	25.7	32	34.8	Ref		
Yes	81	74.3	60	65.2	0.65	0.35	1.19
Difficulty in Getting Condoms***							
No	62	80.5	52	89.7	Ref		
Yes	15	19.5	6	10.3	0.48	0.17	1.32
Partner Controls Sex or Condom Use***							
Always	16	19.8	13	21.7	Ref		
Sometimes/Unsure	28	34.6	23	38.3	1.01	0.40	2.53

	Inconsistent Condom Use (110)		Consistent Condom Use (93)		Univariable Logistic Results		
	N	%	N	%	OR	95% CI	
Never	37	45.7	24	40.0	0.80	0.33	1.95
Probable Depression							
No	58	54.2	67	72.0	Ref		
Yes (CES score ≥ 24)	49	45.8	26	28.0	**0.46**	**0.25**	**0.83**
Ever Experienced Physical Violence							
No	33	30.0	39	41.9	Ref		
Yes	77	70.0	54	58.1	0.59	0.33	1.06
Forced Sex Ever							
No	95	86.4	81	87.1	Ref		
Yes	15	13.6	12	12.9	0.94	0.42	2.12

Note: Odds Ratios in bold are significant (<.05)

Italicized items are continuous (median, Q1, Q3)

Abbreviations: Center for Epidemiologic Studies- Depression Scale (CES-D);

* Among those who reported having a boyfriend/girlfriend in the last 6 months (L6M)

**Among those reporting sexual activity ever

***Among those reporting sexual activity in the last 6 month

Table 4-5 Multivariable Associations between Sexual Self-Efficacy and Consistent Condom Use among Sexually Active Adolescent men and women (n=390)

	Men: Multivariable			Women: Multivariable		
Lifetime Consistent Condom Use	aOR	95% CI		aOR	95% CI	
Sexual Self-Efficacy						
Low	Ref			Ref		
High	3.51	1.86	6.64	1.43	0.74	2.77
Age in years				0.70	0.51	0.97
Probable Depression						
No				Ref		
Yes (CES score ≥24)				0.49	0.26	0.92
Ever Experienced Physical Violence						
No	Ref			1.00		
Yes	2.70	1.37	5.32	1.59	0.82	3.08

Note: Adjusted Odds Ratios in bold are significant (<.05)

Italicized items are continuous (median, Q1, Q3)

Abbreviations: Center for Epidemiologic Studies- Depression Scale (CES-D);

Chapter 5. Summary and Recommendations

5.1 Abstract

In this chapter, I highlight and identify how Bandura's theory of self-efficacy has been used within research among adolescents in sub-Saharan Africa and link the importance of gender when examining sexual decision-making among adolescents living in hyper-endemic settings, with a specific focus on adolescents living in Soweto, South Africa. I also discuss how the findings that are presented in this thesis can be utilized to inform policy and programs aimed at achieving international goals to end AIDS by 2030. I conclude by recommending areas that are needed for future research and how psychosocial constructs such as sexual self-efficacy can be incorporated into broader examinations of sexual decision-making practices among adolescents in South Africa. I further focus on the importance of addressing the gendered dimensions of the epidemic through the creation of interventions that work towards addressing gender inequities within HIV hyper-endemic settings such as South Africa.

5.2 Overview

. The specific objectives of my thesis were to: 1) describe the gendered differences in prevalence and determinants of SSE among adolescent men and women (aged 14-19) in Soweto, South Africa; and 2) to measure the prevalence of consistent condom use and the association between high-SSE and consistent condom use among adolescents (aged 14-19), stratified by gender.

Chapter 1 described the importance that adolescents play in the global HIV epidemic, and how young people in South Africa, specifically adolescent women are disproportionately at risk of HIV acquisition. This chapter introduced the concept of self-efficacy and how these constructs have been used to understand sexual behaviour, as well outlined the thesis objectives, hypotheses, and study design. Gaps in related research regarding understanding sexual self-efficacy among adolescent men and women in sub-Saharan Africa were presented as well as the relevance that this research has within global efforts to end AIDS by 2030.

Chapter 2 critically reviewed the literature pertaining to adolescent sexual health research within sub-Saharan Africa that has included measures of SSE as an important explanatory or outcome variable. In order to account for the unique needs of adolescents' sexuality within the context of sub-Saharan African, HIV epidemic studies were included if they focused solely on the age range of 10 to 26 or participants had a mean age between 10 and 19 (based off of the WHO definition of adolescents). The review identified 63 articles from 44 different studies conducted within 14 different sub-Saharan African countries that included the construct of SSE within their analysis. SSE measurements within the reviewed studies ranged in number of items and validity. The evidence from sub-Saharan African studies revealed that there are significant gaps in instilling SSE among adolescent men and women, and further that high-SSE differentially determines sexual behaviour among adolescent men and women. Although a number of studies found that women have high-SSE, this was mainly found to be associated with unwanted sexual refusal, and less so for condom use. The uncertainty in conclusive results found within this review indicate that future work is needed to examine the gender differences in barriers to SSE, as well as the translation of SSE into HIV preventative behaviours including consistent condom use.

Chapter 3 and 4 focus on objective 2 and 3 of this thesis, respectively. Using data from the Botsha Bophela Adolescent Health Survey (BBAHS), Chapter 3 looked at the prevalence and determinants of high-SSE among adolescent men and women (objective 1). SSE was defined based off a dichotomized score from a SSE scale that asked participants questions regarding their confidence in their ability to perform a range of sexual behaviours including condom use, refusal of unwanted sex and communication with sexual partners. This analysis included sexually experienced and inexperienced adolescents and found that women had significantly higher levels of SSE compared to adolescent men (72.3% of adolescent women reported high-SSE compared to 49.5% of adolescent men, $p<0.001$). Higher SSE was associated with more positive sexual relationship beliefs as well as lower depressive symptomology among adolescent men and increased HIV knowledge, positive condom and for women, sexual relationships beliefs, never having experienced physical violence, and having an adult caregiver in the home among adolescent women. Similar to previous South African adolescent studies, these results highlight in order to increase SSE among adolescent men and women there is a need to redress harmful sexual beliefs which contribute to high-sustained

levels of gender inequity, and HIV risk (272). These results imply a need for gender-targeted efforts to promote high-SSE. Moreover, gender norms and roles need to be included within future gender-transformative sexual risk reduction and HIV prevention initiatives and research.

Chapter 4 examined whether high SSE was associated with consistent condom use among sexually active adolescents in BBAHS. Utilizing the same SSE scale as Chapter 3, this analysis sought to measure prevalence of consistent condom use and examine gender differences in the relationship between high-SSE and consistent condom use among sexually experienced adolescents. Results revealed that around 40% of adolescents reported lifetime consistent condom use, with no significant gender differences. When controlling for potential confounders high-SSE was predictive of consistent condom use among adolescent men but not women. These results align with previous HIV prevention interventions and results from the comprehensive review outlined in Chapter 2 demonstrating that heightened SSE is associated with increased consistent condom use for adolescent men but not women (200, 209). For adolescent women, having higher probability of depression was associated with reduced odds of consistent condom use. This finding aligns with existing South African research indicating that gender-transformative HIV prevention messaging needs to consider syndemic risks of poor mental health and violence experienced by adolescent women (108). Among adolescent men, findings reveal that after controlling for ever experiencing physical violence the relationship between high-SSE and physical violence was strengthened. Thus, promoting high-SSE among adolescent men who at early stages within sexual initiation are having multiple partners may help to increase consistent condom use, in turn decreasing HIV incidence among adolescents in priority HIV-endemic settings such as Soweto.

5.3 Unique contributions

The BBAHS is a large cross-sectional survey of adolescents aged 14 to 19 living in Soweto South Africa. The study included participants from formal and informal settings, in and out of school, and adolescents pre-and post-sexual debut, allowing for unique analyses examining important predictors of behaviours within this high HIV-risk setting. The BBAHS is part of an ongoing collaboration of South African and Canadian researchers from Simon Fraser University in Canada, the British Columbia Centre for

Excellence in HIV/AIDS in Canada, the University of the Witswatersrand in South Africa, and the Perinatal Health Research Unit (PHRU) in Soweto, South Africa, making this thesis project strongly supported and informed by a diverse range of experts in the area of HIV/AIDS and adolescent SRH.

Adolescents' globally are a priority population for public and global health initiatives, however are often ignored and under-researched (31, 236, 273). This is problematic given that in the context of the global HIV/AIDS epidemic adolescents face disproportionate burdens. Today, the largest number of individuals globally are entering an age where they are beginning to initiate sexual activity. This is particularly true within sub-Saharan African nations such as South Africa, where nearly a third of the total population is under the age of 30 (274). Despite the growing needs of young people globally, younger aged adolescents (e.g. those under 18) are often ignored within SRH research due to challenges in recruitment and ethical considerations surrounding informed consent (275). This thesis provides important contributions to adolescents at a key transitional period where sexual debut is occurring and gender norms and beliefs are being formed (275). It is my hope that the results from this study will be used to contribute to important conversations regarding the inclusion of younger aged adolescents within HIV prevention studies that explore and acknowledge the complexities of sexual –decision-making within the key early stages of sexual initiation.

Contextualizing sexual decision-making among priority populations of young people needs to focus on the importance of gender and the implications that early engrained gender roles and norms have for SRH across the life course (157, 272, 276). Gender is a key social determinant of health, yet results from Chapter 2 reveal that within adolescent SRH studies in South Africa, including gender-stratified analyses has been largely overlooked. It is not enough to simply include gender within multivariable analyses, as differences within gender groups are critical for understanding the intersections of adolescent men and women's identities, and in turn their influence on sexual decision-making (277). Furthermore, studies that incorporate psychosocial constructs such as self-efficacy have historically looked at the relationship between heightened SSE and sexual behaviour (e.g. condom use and sexual refusal) on individual levels. This narrow focus often ignores the important determinants of psychosocial beliefs and what barriers affect the ability for adolescent men and women to differentially translate perceived control (e.g. self-efficacy) into actual behaviour. This

may be particularly important within settings such as South Africa, where previous research has highlighted the collective aspect of decision-making (92). This thesis provides important insight into gender differences in the role that psychosocial determinants of HIV and sexual decision-making power play in the sexual decision-making power of adolescents living in an HIV hyper-endemic setting in South Africa (9, 278).

Results from this thesis reveal that adolescent women have higher HIV knowledge, more positive beliefs about condom use and sexual relationship norms, and those who are sexually active have higher perceived access to condoms compared to men. This combination may be indicative to successful programming aimed at addressing the gendered epidemic in South Africa by focusing educational and empowerment messaging towards young women. As high-SSE was associated with consistent condom use among men, there is a need to address the gendered gaps in levels of SSE as well as potential determinants including harmful relationship beliefs, HIV knowledge, and access to condom use. Providing equal access to HIV prevention program and tools (e.g. condoms) will not only work to benefit adolescent men, through improved uptake of HIV prevention behaviour (e.g. condom use), but will work to provide increased relational equality in sexual decision-making. Thus, improving SRH outcomes for the adolescent and young women partners who are disproportionately affected by the HIV epidemic.

Chapter 3 and 4 of my thesis both revealed that among this sample of 14 to 19 year old adolescent women (both sexually experienced and inexperienced) have much higher levels of SSE compared to their male counterparts). Individual SSE scale item differences in Chapter 3 and 4 respectively reveal that overall adolescent women were more likely to feel they could use a condom every time they had sex, however when restricted to only those who have ever had sex, there were no gender differences. This may indicate that once adolescent women begin to have sexual relationships, they may have reduced perceived control over the ability to negotiate and use condoms within their sexual relationships. This may be particularly true among adolescent women within age-disparate relationships, as univariate results within Chapter 3 revealed that adolescent women reporting a partner 5 or more years older than themselves in the last 6 months had lower-SSE compared to those no reporting age-disparate partnerships.

Nearly a third of sexually experienced adolescent women reported being in a relationship with someone 5 or more years older than themselves. Intergenerational relationships which often involve transactional sexual relationship have been recently termed ‘Blessers’ (52). High numbers of reported intergenerational relationships among adolescent women in our study is concerning as recent research within South Africa highlighting a cycle of HIV transmission where young women between 15 and 24 are primarily acquiring HIV from partners who are on average 8 years older than themselves (279). Previous research has documented that “blesser-type” relationships are common in South Africa, are often marked with large relationship power inequities and frequently consist of transactional exchanges (50, 124, 158, 174, 270), including condom use negotiation. Thus, although sexually active adolescent women in South Africa have strong intentions to use HIV preventative behaviours, confounding socio-structural factors (e.g. relationship commitment level, gender-based violence, economic dependence and depression) are likely synergistically interacting to create environments in which adolescent women are unable or fear negotiating condom use within their sexual relationships (249, 280, 281). The relationship dynamics highlighted within this thesis contributes to the differential needs and factors associated with positive and safe sexual decision-making among adolescent men and women in South Africa.

Potential reduced control in consistent condom use among adolescent women is further highlighted in Chapter 4 as high-SSE was not found to be associated with higher consistent condom use among adolescent women. Instead, reductions in depression or potentially the determinants of depression within age-disparate relationships may be more important for the uptake of condom use. This finding aligns with existing South African research indicating that gender-transformative HIV prevention messaging needs to consider focusing on factors mediating the relationship between mental health and consistent condom use among adolescent women (108). These findings reveal that high levels of depression, and it’s influence on condom use and SSE should be further explored, as it is likely influenced by high levels of power inequities experienced within age-disparate relationships (105, 107, 125). Together I believe these findings highlight a critical need to redress sexual health messaging and further explore the barriers to HIV prevention strategy uptake, particularly for adolescent women in South Africa who face some of the highest inequities in HIV acquisition globally (50, 253).

5.4 Strengths and limitations

The strengths and limitations of this thesis have been previously described within Chapters 3 and 4 respectively. For example, gender disaggregated data presented within this is an important contribution to the literature. Despite this strength, however, I acknowledge that there is heterogeneity within groups of adolescent men and women in this setting that cannot be generalized. In addition, I will now describe some of the strengths and limitations of the measurement tools, sampling strategy and analytical techniques used within this thesis.

5.4.1 Measurement tools

As described within Chapter 2 of this thesis this psychosocial construct of decision-making within the context of sexual health among sub-Saharan African adolescents has been widely utilized, however there is no current gold standard for scale item inclusion. The specific scale used within the analyses in this thesis may be measuring a number of different self-efficacy concepts, and thus there may be limitations in referring to the single scale as 'sexual self-efficacy'. Results from the PCA analysis on the SSE scale resulted in all 6 items highly loaded on a single component, indicating all 6-items explain one single aspect. Future work, however may wish to conduct further statistical tests to examining how different components of the SSE scale (e.g. sexual refusal versus condom use) help to explain or are associated with different HIV preventative behaviours. Moreover, as mentioned in Chapters 3 and 4 many of the responses to the SSE scale items would have been based off of hypothetical situations for participants who have not initiated sexual activity or who were not in a relationship at the time the study took place. Thus, results from this thesis should be taken with caution.

In order to account for non-generalizability of scale items, the study team conducted statistical validation on the scale and found that when the scale was dichotomized so that high-SSE was measured based off of definite 'yes' responses to the scale items this allowed for an increase in Cronbach, while providing a substantial agreement with original scale. Gender differences in the Cronbach alphas for the scales reveal that this specific scale may not be equally measuring SSE for adolescent men and women. Responses to the SSE scale items may be further influenced by gender bias in the interpretations of the questions. Thus, future scale development should

consider pilot studies to determine gender-specific questions, which may help to capture gendered interpretations of SSE constructs. Construct validation tests among the different psychometric scales used within this thesis (e.g. sexual self-efficacy, condom use beliefs, and sexual relationship beliefs) showed moderate to good internal consistency within the sample described in Chapter 1. These statistical tests do not however take into consideration face or content validly of the instruments and in previous chapters I recommend that future research should aim to develop qualitative and quantitative validity tests that specifically account for gender differences and context-specific interpretations of specific items being measured.

In Chapter 4 the use of lifetime consistent condom use as the outcome variable may not be the best predictor of recent condom use, which may have been more likely to be influenced by shifts in SSE. I acknowledge that this might not be the best variable to use in order to measure consistent condom use, however this was the most robust variable that we could have used based on the distribution of the data. As a sub-analysis of this study we looked at the bivariate association between high-SSE and last condom use and found a significant association for both adolescent men and women, however the small number of condomless sex reported at last sex could not warrant a multivariate analysis. As this study was conducted cross-sectionally there is no way to determine directionality of the effect between high-SSE and consistent condom use. Future work should consider examining gender differences in the translation of high-SSE into changes in sexual behaviour, including consistent condom use over time through more rigorous longitudinal research designs.

Furthermore, a number of a priori determinants for both SSE and consistent condom use of interest including relationship dynamics (e.g. relationship controlling behaviours, intimacy, trust and IPV) could not be tested in the models, as they were not included in the BBAHS. I recommend that future SRH studies within the context of adolescents in South Africa consider including survey items that allow for the exploration of relationship dynamics and their impact on the uptake and agency in performing HIV preventative behaviours.

5.4.2 Sampling method and design

Although the study team conducted targeted sampling within predetermined geographical community-based locations in Soweto, this sample is likely not representative of all adolescents living in South Africa. However, as the majority of studies examining sexual decision-making among adolescents in South Africa have been conducted in school settings through interventions, the data present herein add unique contributions to the literature.

Furthermore, the inclusion of adolescents aged 14 to 19 allowed for the study team to investigate a critical transition period for adolescents during puberty and as they beginning to initiate sexual activity. Research among adolescents often exclude very young adolescents due to ethical considerations regarding informed consent, thus findings from this thesis allow insight into the sexual decision-making practices of a very young population of adolescents living in the peri-urban setting of Soweto, South Africa. For those under the age of 19 we were only able to include individuals in our study that were able to provide parental consent, which may have limited our ability to target harder-to reach adolescents or those who are residing in child-headed households.

5.4.3 Analytic technique

This thesis was conducted in collaboration with a large study team that included experts in data analysis and statistics. This collaboration also included insight from South African scholars and experts in adolescent SRH, thus I am confident that the data analysis presented within this thesis is of the highest quality. Different statistical models were used within this thesis including an explanatory multivariable model in Chapter 3 and a confounding model in Chapter 4, which each possess unique strengths and weaknesses.

In Chapter 3 explanatory models were chosen in order to examine the gender differences in the determinants for high-SSE. Explanatory factors included within the univariable models were based off of the literature and available data within the BBAHS. Chapter 3 analyzed the factors associated with high-SSE among the entire sample of BBAHS participants including those who have and have not initiated sexual activity. By including the entire sample, we were able to examine whether or not high-SSE was

significantly different between those who have and have not yet initiated sexual activity. For those who have not initiated sexual activity, the responses would have been based off of hypothetical situations in which they perceive they could perform a number of behaviours if they were to be in a sexual relationship. Despite no significant difference in SSE between adolescent men and women who have and have not ever had sexual intercourse, inclusion of the entire sample allowed for the examination of key factors influencing SSE among adolescents who have not yet initiated sexual activity, which is a priority population for HIV incidence reduction strategies.

After observing distinct gendered differences in the association between high-SSE and condom use among adolescent men and women found in Chapter 3 I was interested in examining the independent association between having high-SSE and consistent condom use. Thus, for Chapter 4 it was decided that two distinct confounding models would be used to assess the association between high-SSE and consistent condom use for sexually experienced adolescent men and women, respectively. Factors included in the final confounding model were based off of findings in Chapter 2, availability of data and results from the univariable analysis examining factors related to consistent condom use. Utilizing a confounding model allowed to examine the distinct relationship between high-SSE and consistent condom use, however in utilizing this type of model some meaningful associations between consistent condom use and other explanatory factors may have been lost.

For both analyses included within Chapters 3 and 4 of my thesis limitations for what could be included within the models were based off what was captured in the BBAHS. Some items of interest highlighted within the theoretical framework, including sexual relationship power and intimate partner violence, of my thesis could not be adequately assessed. For example, I was not able to include validated items measuring sexual relationship power, as this was not a scale included within the BBAHS.

In both models I found significant differences in level and determinants of SSE between adolescent men and women. As the data utilized for this thesis was cross-sectional in nature the analyses undertaken were not able to examine the effects of SSE on consistent condom use overtime. Many of the factors included both within the explanatory and confounding models were dichotomized, which may limit some of the statistical power of the outcomes of interest. Furthermore, explanatory and confounding

models are limited in their ability to examine complex pathways that may be at play in the relationship between high-SSE and consistent condom use for adolescent men and women outlined in the theoretical framework in Chapter 2. Despite some of the limitations to these analyses and the data, this thesis provides important information regarding gender differences in priority populations of adolescents that are often overlooked and is a launching point for future studies that should consider utilizing more complex statistical methods such as structural equation modeling. This type of modelling will allow for a greater understanding of the important pathways to sexual decision-making.

5.5 Application of research findings

This thesis presents evidence that theoretical constructs of sexual behaviour, including gendered determinants of SSE and the translation of high-SSE into sexual behaviour, have important implications for future work wishing to initiate gender-transformative interventions. Given the complexities of the HIV epidemic affecting AYA within South Africa, there is a clear need for multi-levelled comprehensive interventions. Results from the analyses included within this thesis highlight a critical need for interventions that focus on specific gendered dimensions of the HIV epidemic, including addressing syndemic HIV risks of high levels of violence, trauma and depression (55, 108, 261, 282, 283). Comprehensive HIV programming needs to consider the context and dynamics of relationships, particularly for adolescent women who face numerous barriers to enacting perceived control over male-controlled HIV prevention strategies such as male condoms. This calls for increased efforts working to increase access to female controlled methods including the female condom and PrEP (in oral, gel and vaginal ring formulations) for high-risk populations (280). Although the number of studies regarding PrEP acceptability among AYA in endemic settings is sparse, qualitative evidence suggests that AYA women are excited about PrEP, as they feel that PrEP may require less negotiation compared to condoms (37, 146). Despite the promise of new biomedical HIV prevention strategies, evidence suggests that women and young people in sub-Saharan Africa have the lowest adherence rates to PrEP (1, 62, 87, 284). Similar to low rates of consistent condom use among AYA women, barriers to HIV treatment and PrEP adherence may due to low risk perception, fear of stigmatization and experience of intimate partner violence, which intersect with competing demands within

the lives of women (285, 286). As such, more research is needed to examine the uptake, acceptability and adherence of these strategies, as well as whether behaviour change interventions that focus on individual-level determinants such as self-efficacy will translate into improved uptake and adherence of PrEP among AYA women (60).

With the expansion of female controlled barrier and biomedical prevention methods, it is critical for research continues to examine some of the challenges to utilizing, accessing and being adherent to a range of HIV prevention tools. Furthermore, the important gendered determinants of self-efficacy for using these new prevention mechanisms should be considered. Results from this research reveal that in regards to the HIV epidemic among adolescents in South Africa, gender needs to be considered at every point in HIV prevention strategies, especially as we look towards implementing and evaluating gender-based prevention methods and intervention strategies.

In order to reduce the disproportionate burden of HIV and STIs globally among efforts need to consider the unique needs of adolescents and young adults, particularly women, including increasing access to youth friendly SRH packages. This includes equal access to comprehensive, high-quality HIV education (27). Results within Chapter 3 indicate that adolescent men have lower HIV knowledge, and reduced SSE, both of which have been previously shown to be important determinants in sexual behaviour among young people (98, 204, 287, 288). Moreover, Chapter 4 revealed that a high number of sexually active adolescent men have difficulty accessing condoms. These results indicate that HIV education, sexual empowerment messaging and condom access should be scaled-up, particularly for adolescent men who have traditionally been ignored within prevention movements given the generally low-risk group they fall within compared to their female counterparts. As previously discussed, sexual decision-making is dyadic, and thus engaging men in gender-transformative efforts at young ages is critical for reducing the high sustained incidence of HIV among AYA women in South Africa

5.6 Global health implications

From a global health perspective, the findings from this thesis are of great importance. As previously discussed South Africa is home to the highest absolute number of people living with HIV in the world. Furthermore, adolescents in South Africa

make up 30% of the population and are disproportionately affected by the HIV epidemic on a global scale. Incidence among adolescent women are particularly concerning with rates being up to 4 times higher than adolescent men within the same age group (37). As discussed in previous chapters, findings highlight that adolescent women in South Africa likely have high sexual self-efficacy to enact preventative actions (e.g. refusal of unwanted sexual intercourse and consistent condom use). This thesis further reveals that for adolescent women having high-SSE may not be effective at translating into the use of male controlled condoms which remains to be the most commonly used tool for HIV prevention. The null statistical association between high-SSE and consistent condom use may be a reflection of relationship dynamics and social norms that influence youth's sexual scripts in negotiating and using condoms, particularly in perceived committed relationships (66, 97).

Findings surrounding significantly lower SSE among adolescent men than women raises concerns, given that higher SSE was associated with increased consistent condom use among adolescent men in our study. As we move towards international targets to end AIDS by 2030 instilling SSE in young men may be an important global health intervention for increased condom use within South Africa. Results from Chapter 3 indicate that having negative sexual relationship beliefs was associated with decreased odds of SSE among both men and women, thus indicating that addressing sexual relationship norms and ingrained beliefs at young ages may help to increase SSE, and in turn the uptake of HIV preventative behaviour in adolescents. Improving SSE among men in early stages of adolescence thus may be best achieved by focusing on redressing harmful sexual relationship beliefs at a young age prior to the initiation of sexual activity.

Results from Chapter 4 of this thesis indicate that efforts aimed at reducing high-sustained levels of HIV incidence among adolescent women in South Africa must move beyond the promotion of SSE. Adolescent women in South Africa are faced with one of the highest risk of HIV incidence in the world and are key population to meet global efforts to end AIDS by 2030. It is my hope that results from this thesis will be used to inform future research and intervention strategies that seek to address the multileveled and complex barriers to HIV prevention uptake among priority populations of adolescent women living within HIV hyper-endemic settings such as Soweto, South Africa.

5.6.1 Intervention and policy recommendations

Findings from this thesis add to a growing body of literature that points to the need for gender targeted, and youth-specific sexual health education and intervention strategies. For example, this thesis reveal a number of socio-structural and relational level determinants of SSE that should be further investigated and incorporated within multileveled HIV prevention research and intervention strategies. On a societal level, poverty, sexual agency, and risk, are differentially predicted and influenced by entrenched societal norms of masculinity and femininity (71, 219, 289). For example, in Southern Africa, high levels of poverty have been associated with increased engagement in marginalized employment, such as migrant work among young men, and increased economic dependence and engagement in transactional and commercial sex among young women (125, 158, 290). For AYA women, this economic dependence reduces sexual relationship power within partnerships, which decreases agency to negotiate safe sex, and increases risks of IPV and HIV acquisition (109, 139). For AYA men, previous research has suggested that poverty and unemployment are associated with increased controlling behaviours, but this has not been widely explored and further research is needed (173). Reviewed studies highlight important gaps in the translation from behavioural intention into actual behaviour. Given the gendered nature of the HIV epidemic and the targeted efforts required to address structural and social barriers to HIV prevention options for AYA, poverty alleviation and economic empowerment efforts may prove to be essential for improving condom use intentions and use among AYA (106).

Findings within both Chapters 3 and 4 demonstrate that young women growing up post-apartheid within peri-urban settings of South Africa have high levels of confidence that they can engage in sexual risk reduction strategies that include talking to their partners about condom use and refusing unwanted sexual intercourse. These findings align with previous qualitative research indicating that gender relations in South Africa may be shifting to be increasingly equal (272). This shift may, however, be more so in attitudes and beliefs than behaviours, as our findings also found that high-SSE was significantly associated with consistent condom use among sexually experienced adolescent men, but not women. Gender differences in scale items between chapter's 3 and 4 reveal that adolescent women who have initiated sexual activity may be less confident in their ability to use condoms every time they have sex. Thus, highlighting that

this sample represents a key transitional stage in adolescence where sexual initiation is occurring and sexual decision-making practices are shifting in response to the realities of engaging in intimate relationships. Thus, in order to improve policies and SRH programming for priority populations of adolescent women, it is critical that interventions target younger-aged adolescents. Strategies should be cautious, however to avoid focussing on abstinence-based messaging so as to ensure an array of strategies are promoted. Comprehensive SRH strategies should include instilling positive communication between partners and supports, improving condom negotiation and use and creating environments that promote agency within sexual decision-making for both adolescent men and women.

In South Africa, many interventions to promote safe sexuality have been framed under a “sex as risky” lens. Furthermore, policies that do not promote safe sexuality, such as the lack of condom access within primary and secondary schools (62), likely limits the use of condoms for school-going adolescents. Previous South African interventions that have sought to address barriers to condom use, including harmful gender norms in HIV interventions have been successful at reducing the perpetuation of violence, and in turn genital herpes (HSV) incidence (125, 291, 292). To date, these behavioural-focused programs have however been unsuccessful at reducing HIV incidence among adolescent men and women (57).

In response to gender inequities in HIV incidence and the lack of evidence stemming from behavioural interventions, there has been increased focus on scaling up women-centered prevention strategies including PrEP for adolescent women (53, 146). As nations such as South Africa enter a new era of prevention strategies, policies need to consider some of the findings highlighted within this thesis. For example, we must understand the relational context in which sexual decision-making is taking place. This includes understanding the role that intimacy, trust and relationship power have in deciding to use HIV prevention strategies. Moreover, social norms within peer groups surrounding perceptions of these new HIV prevention strategies should be explored. Efforts should continue to develop comprehensive intervention strategies that consider gendered-determinants of sexual decision-making as well as the relational context (within intimate partnerships and peer groups) in which decisions take place.

5.6.2 Generalizability of the study

This work demonstrates important gender differences in sexual decision-making that need to be considered within HIV prevention programming for adolescents on a global scale. As, HIV prevention strategies such as male condoms are gendered in nature, prevention strategies need to consider and acknowledge the importance of targeted strategies to address the differential barriers to enacting HIV preventative tools for adolescent men and women, respectively. The non-probability sampling used to recruit participants for this study, however limit the ability for the results of this thesis to be generalizable to adolescents in the general population of Soweto and South Africa. Furthermore, this work was conducted between 2008 and 2010, and as the progression in HIV prevention and intervention studies globally are fast moving, these results may not be generalizable to the current cohort of adolescents growing up within Soweto, or South Africa as a whole.

5.7 Future research

Future directions and research have been acknowledged in Chapters 2, 3, and 4 respectively. In short, inconsistencies in scale measurements and reporting found within Chapter 2 call for a need to develop culturally relevant scales for measuring sexual decision-making that take into consideration gendered and context specific interpretations and implications of individual items within the scales. Furthermore, given the gendered elements at play within the HIV epidemic in South Africa, there is a need to rigorously report gender-disaggregated data within HIV prevention studies. Chapter 3 revealed that having an adult caregiver in the home was an important predictor of high-SSE for adolescent women in our study, however the data available within BBAHS was unable to examine the quality of caregiver-youth relationships, indicating a need for future research. Descriptive statistics in both Chapters 3 and 4 revealed that there is likely important associations between sexual decision-making and sexual behaviour that is influenced by the dynamics of the relationship (e.g. relationship power equity, intimacy, and trust). Relationship-level determinants have not been widely examined within the context of South African adolescent SRH research, indicating a vital point for future research initiatives (293, 294). Another important finding within Chapter 4 revealed a relationship between depression and condom use that has been previously

described within cross-sectional studies, the directionality of this association is not as well described, particularly within different relationships such as those involving 'blessers', indicating an area of future research which examines the syndemic risks within relationships marked with high power inequities.

5.7.1 Developing high quality, multileveled comprehensive gender-transformative HIV prevention interventions and program indicators

I believe that there is a critical need to focus on developing comprehensive multi-levelled HIV interventions that are youth-centered and specifically targeted to the unique needs of adolescent men and women respectively. Furthermore, this research should focus on developing culturally, and context-specific measurement tools in order to adequately assess the outcomes of HIV prevention interventions within the settings in which they take place. This will be important in the scale up and roll out of biomedical prevention technologies such as PrEP for adolescents in Africa (146). Future prevention work should also examine the gendered determinants of SSE regarding PrEP utilization and adherence, as demonstrated within this thesis; SSE unfolds differently among young men and women.

Comprehensive interventions, that include PrEP for young women, also need valid program indicators that are contextually based. My work has revealed that at present no standard for measuring SSE is available within adolescent SRH studies. A large number of the items utilized within sub-Saharan African settings have been theorized and developed within western contexts and may not be relevant in this context. In order to reverse historical legacies of colonialism, apartheid and as we move forward in international efforts to end AIDS by 2030, it is paramount that future research acknowledge the unique needs and rights of adolescents living in the global South, through research methods and interventions that engage young people within their respective communities at every stage of the process (24, 295, 296).

5.7.2 Qualitative assessments of psychosocial and relational scales developed in western settings

There is a paucity of literature looking to normalize sexuality among young people in South Africa. Sexual health research has been historically focused on risk and

implementing effective risk reduction strategies. I believe future research in this area should be framed utilizing sex positive research methods which seek to provide contexts in which young South Africans feel comfortable discussing sexuality, including their desires and needs with their sexual partners (25). As noted already, sexual communication has been previously found to be a significant determinant of condom use among adolescents (297). Furthermore, partner communication is also important for STI management, particularly within South Africa where syndromic management is the main method of identifying and treating STIs (298). Results from this thesis reveal that adolescent men in Soweto may have reduced sexual communication skills compared to adolescent women their own age. Thus, future interventions and studies should aim to promote sexual communication skills; particularly among men at early stages of adolescence and young adulthood who are often left out of HIV prevention strategies.

Our findings highlight that SSE differentially predicts condom use for adolescent men and women, however it is important to note that condom use is a dyadic process (68). Moreover, condom use is not the only method of HIV prevention, particularly within long-term relationships. Therefore, future research should begin to explore the predictors and outcomes of SSE among adolescent men and women and within young couples, through youth-centered and informed qualitative methods that may be better able to explore the impact of SSE within sexual relationships, and whether this predicts condom use as well as other HIV preventative behaviours (e.g. testing and sexual relationship communication) (68). Insights regarding relationship characteristics and dynamics can then be used to help develop scale items, which can potentially be used within contextually based and gender-sensitive bio-behavioural surveys.

5.8 Conclusion

In South Africa, gender inequities and high-sustained HIV incidence among adolescent women remain. Many studies within the context of South Africa have aimed to understand determinants and predictors of behaviour change among priority population of adolescents. These studies are often grounded within psychosocial theoretical frameworks with little consideration for the broader HIV risk environments in which youth enact sexual relationships. My thesis has added to the evidence that gender is a key and critical determinant in sexual decision-making and must be considered in

order to address the gender inequities in the epidemiological spread of HIV among adolescents within South Africa.

Research gaps highlighted within my work call for increased understandings in gendered dimension in sexual decision-making patterns among adolescents in priority settings such as Soweto. As noted above, future research is needed to examine and evaluate the role that relationship dynamics (including intimacy, trust, satisfaction and control) play in influencing the uptake of HIV preventative behaviours. Furthermore, in order to meet global targets to end AIDS by 2030, results from this thesis reveal that there is a need for multileveled gender-transformative efforts that move beyond an individual-level focus to include promotion of the social determinants of health, including efforts that seek to improve mental health and reduce violence for adolescent women and men living within HIV hyper-endemic settings.

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Appendix A.

Botsha Bophelo Adolescent Health Survey

The development of this survey has been described within Chapter 1 of this thesis.

Filename: bbahssurvey.pdf

Appendix B.

Consent Forms

PERINATAL HIV RESEARCH UNIT

SFU SIMON FRASER UNIVERSITY THINKING OF THE WORLD

ADOLESCENT INFORMATION LEAFLET AND STATEMENT OF ASSENT

STUDY TITLE: **The Kganya Motsha Project: Understanding Adolescents Made Vulnerable by HIV: A Study of Adolescents in Soweto, South Africa**

Investigators: Professor Glenda Gray, Ms Busi Nkala, Ms Janan Dietrich, Dr Cari Miller, Ms Angela Kaida, Dr R Hogg
Institutions: Perinatal HIV Research Unit, Soweto; Simon Fraser University, Canada

Introduction

Hello, my name is ……, I am a ……..…… (position) at the Kganya Motsha Adolescent Centre of Perinatal HIV Research Unit, in Soweto. I would like to invite you to think about taking part in a study titled "*The Kganya Motsha Project: Understanding Adolescents Made Vulnerable by HIV: A Study of Adolescents in Soweto, South Africa*".

We will need you to read this form or have it read to you. We request that you take enough time to make a decision if you wish to participate in this study. Speak to people you trust like your friends, your parents, your relatives, or your doctor if that is going to assist you to make a decision. We will check your understanding of this form to ensure that we have explained everything clearly.

If you decide to take part in the study, we will request you to sign the consent statement at the end of this information leaflet. Signing the statement means that you have read the information leaflet (or had it read to you), you fully understand and agree to take part in the study. You will be given a copy to keep.

Why are we doing this study?

In research studies, investigators try to find answers to a certain question or questions. In this study, we would like to find the following:

1. To find out the social characteristics and personal attributes of adolescents who are consenting to HIV voluntary counseling and testing and those who are not.
2. To determine the HIV prevalence of study participants and estimate the risk for HIV in the adolescent population of Soweto.
3. To find out reporting differences between information collected through the use of individual reporting methods using a computer or cell phone technology and being interviewed by a person.
4. To explore risk for HIV infection including knowledge of HIV, understanding of risk to the individual and what role do gender, violence and poverty play.
5. To test and evaluate one or more participatory research methods to increase adolescent efficacy to internalize HIV risk and prevention strategies

Approximately 1500 adolescents will take part in the study of the Perinatal HIV Research Unit in Soweto.

Why have I been requested to assist in the study?

We are asking you to assist in this study because you are:

- Between 14 and 19 years of age and live in Soweto
- You are willing to give consent for your participation in the study

Is it necessary for me to take part in a research study?

No, you may decide not take part in the study.

PERINATAL HIV RESEARCH UNIT

SFU SIMON FRASER UNIVERSITY THINKING OF THE WORLD

PARENTS/GUARDIAN'S INFORMATION LEAFLET AND CONSENT FORM

STUDY TITLE: **The Kganya Motsha Project: Understanding Adolescents Made Vulnerable by HIV: A Study of Adolescents in Soweto, South Africa**

Investigators: Professor Glenda Gray, Ms Busi Nkala, Ms Janan Dietrich, Dr Cari Miller, Ms Angela Kaida, Dr R Hogg
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Introduction

Hello, my name is ....., I am a ..... (position) at the Kganya Motsha Adolescent Centre of Perinatal HIV Research Unit, in Soweto. I would like to invite you to think about taking part in a study titled "*The Kganya Motsha Project: Understanding Adolescents Made Vulnerable by HIV: A Study of Adolescents in Soweto, South Africa*".

We will need you to read this form or have it read to you. We request that you take enough time to make a decision if you wish for your child to participate in this study. Speak to people you trust like your friends, your parents, your relatives, or your doctor if that is going to assist you to make a decision. We will check your understanding of this form to ensure that we have explained everything clearly.

If you decide to allow your child to take part in the study, we will request you to sign the consent statement at the end of this information leaflet. Signing the statement means that you have read the information leaflet (or had it read to you), you fully understand and agree that your child take part in the study. You will be given a copy to keep.

Why are we doing this study?

In research studies, investigators try to find answers to certain question or questions. In this study, we would like to find out the following:

1. To find out the social characteristics and personal attributes of adolescents who are consenting to HIV voluntary counseling and testing and those who are not.
2. To determine the HIV prevalence of study participants and estimate the risk for HIV in the adolescent population of Soweto.
3. To find out reporting differences between information collected through the use of individual reporting methods using a computer or cell phone technology and being interviewed by a person.
4. To explore risk for HIV infection including knowledge of HIV, understanding of risk to the individual and what role do gender, violence and poverty play.
5. To test and evaluate one or more participatory research methods to increase adolescent efficacy to internalize HIV risk and prevention strategies

Approximately 800 adolescents will take part in the study of the Perinatal HIV Research Unit in Soweto.

Why has my child been requested to assist in the study?

We are asking your child to assist in this study because your child is:

- between 14 and 19 years in age
- would like to give consent to take part in the study
- is willing to ask you to give consent for your child's participation in the study

Is it necessary for my child to take part in a research study?

No, you may decide that your child does not take part in the study.

Appendix C.

Summary of articles included within the literature review

Table C 1 Summary of psychometric properties of the Sexual Self-Efficacy (SSE) measurement items used in peer-reviewed studies focused on the sexual health of adolescents in sub-Saharan Africa

Reference/study aim	Sample population	Methods description	Reliability of scale (if applicable)	Results in relation to outcome variable
1. **Eggers 2016** Predicting sexual abstinence among adolescent boys and girls in Western Cape South Africa	1670 adolescents 12-16 years old from the Western, Cape South Africa participating in the PREPARE trial	Using data from the control arm of the PREPARE trial	4-item self-efficacy to delay sex scale (Cronbach 0.80)	Descriptively males had lower self-efficacy to delay sex compared to girls. Cons to delaying sex predicted self-efficacy for boys but not girls. Time one risk perception predicted later self-efficacy in girls but not boys. The psychosocial I-Change model fit was lower for sexually inactive adolescents compared to sexually active. Perceived pros to abstinence predicted self-efficacy at follow up for sexually active adolescents. Authors discuss that skills to improve self-efficacy should be addressed around the time of sexual debut.
2. **Eggers 2016** Compared sexual attitudes, norms, self-efficacy and intention across three sub-Saharan sites	1166 sexual active students aged 11-18 from three different high schools in Sub Saharan Africa. (One including South Africa)	Data was collected as part of the SATZ- a school-based HIV prevention program which was based on theory of planned behaviour (TPB) Attitudes, subjective norms, self-efficacy and intention were measured using four distinct likert-type scales	Self-efficacy scale used 8-items to assess participants feelings towards being able to negotiate condom use with a sexual partner. Condom use-self-efficacy scale (8-iteams) had Cronbach alpha of: 0.81 for Cape Town, 0.90 for Dar es Salaam, and 0.78 for Mankweng	Self-efficacy associated with intention in all three sites (no difference in the sites). Self-efficacy weakly associated with condom use at last sexual encounter. Women had lower self-efficacy and other determinants of the theory of planned behaviour

3. **Harrison 2016** Gender-focused HIV and pregnancy prevention for school-going adolescents: The Mpondomblili pilot intervention in KwaZulu-Natal	924 students at follow-up aged 14 to 17 year in grade 8 to 10 from the sub district of Umkhanyakude in northern KwaZulu-Natal	Quasi-experimental design for a pilot study for an in-school adolescent HIV prevention program Measured condom use at last sex	Two item 4-point likert responses to "safer sex self-efficacy. Refusing sex without a condom and being able to talk to my partner about condom use No Cronbach provided and the author agreed that their measurements were limited and "may not capture the full range of these concepts"	Girls both within the intervention and control groups had a higher proportion of discussing condom use with their partners. At follow up post intervention girls had increased likelihood to be able to use a condom, this however did not translate into actual condom use at last sex within the follow up period.
4. **Underwood & Schwandt 2015** 'To develop a viable supportive community index and test its association with intermediate variables associative with HIV risk in 16 communities	1418 adolescent girls (11-18) from Botswana (401), Malawi (414) and Mozambique (603)	"Quasi-experimental design" Household cross-sectional survey Independent variable: vulnerable supportive community index Dependent variables were two questions surrounding SSE	Two questions asked regarding condom use and sexual refusal self-efficacy (no Cronbach provided)	Increased self-efficacy to refuse sex associated with lower vulnerability score in all three Sub-Saharan Africa settings Younger age predicted higher self-efficacy to refuse sex
5. **Seutlwadi 2015** Sexual Violence and associated factors among female youths in South Africa	974 sexually active adolescent women 18 to 24 South Africa (out of the total sample of 1417)	Household cross-sectional survey as part of a Love Life collaboration Outcome: self-reported physically forced sex in lifetime	4-item Partner risk reduction self-efficacy (Hanna, 1999) (Cronbach= 0.73)	Bivariate results showed that those who have experienced forced sex had lower partner risk reduction self-efficacy

6. **Jemmott et al 2015** HIV/STI Risk-reduction intervention efficacy with South African Adolescents over 54 months	Grade 6 learners aged 12 to 18 RCT trial of two randomly assigned interventions "Let us Protect Ourselves" Intervention	Main outcome= To assess whether the intervention was success at reducing unprotected sex over a period of time (54-months) unprotected sexual intercourse and condom use (or consistent condom use)	Assessed three types of condom use self-efficacy including 'negotiation self-efficacy (4 items, a=. 94) '; Technical skill self-efficacy' (3 items, a=. 82) and 'impulse control self-efficacy' (3-items, a= .74) Self-efficacy to refuse sexual intercourse (5-items, a=. 92), Self-efficacy to avoid sexual risk situations (4 items, a=. 91)	Results showed improvement in HIV risk-reduction knowledge, condom use expectancies, expected approval of condom use, condom use self-efficacy and sexual intercourse outcomes expectancies, however these effects diminished over time
7. **Eggers et al 2015** Longitudinal analysis examining the theory of planned behaviour and teenage pregnancy	298 adolescent learners (12-16) 51% boys	Using data from the control group of a government funded RCT high school teenage prevention program Structural Equation Modeling to examine the theory of planned behaviour on predicting sex sexual intercourse	Self-efficacy Cronbach alpha= .84 (4 items)	Self-efficacy was the strongest predictor of intention to use condoms using structural equation modeling Age and gender were not predictive of intention to use condoms
8. **Tenkorang 2014** Assessing the perceptions of HIV risk in Kenya	4146 boys and 4037 girls from standard 6 and 7 in Kenya aged 11 to 17	Individual level measures: Knowledge about HIV prevention (Cronbach alpha .82) Longitudinal study of school children from 30 schools in Nigeria	Abstinence self-efficacy (.6) (4-items) Condom use self-efficacy (.6) (2-items) Two separate scales for condom use self-efficacy and sexual refusal self-efficacy (Cronbach for each scale at 0.6 for each)	Condom use Self-efficacy was higher among males than females (significant) Abstinence self-efficacy was higher among females Self-efficacy was negatively associated with engaging in risky sexual behaviours for boys

9. **Tenkorang 2014** Investigating timing to first sexual intercourse in Nigerian youth	8,268 boys and 6, 531 girls not currently enrolled in an intervention	Longitudinal study of school-aged learners in Nigeria over time Dependent variable for this study was age at first sexual intercourse	Dichotomized scale of condom use self-efficacy 4-items made specifically for this study (Cronbach alpha= 0.683) Sexual refusal self-efficacy was measured using one question	Boys had higher condom and sexual refusal self-efficacy compared to girls Youth with higher self-efficacy (both condom use and sexual refusal) engaged in sexual intercourse at earlier ages.
10. **Hanass-Hancock 2014** Change in HIV knowledge, attitudes and practice following participation in a youth literacy and family support program	100 school aged children 11-18 (mean 13.4) in KwaZulu-Natal Exposed= 32 (regularly attended literacy and family support in the last three year Un-exposed= 68	This study presents post-intervention results of a local literacy class on HIV knowledge, attitudes and self-efficacy.	Self-efficacy (Using likert scales that were then dichotomized) 3-items based off of Shamagonam et al. 2006 Cronbach alpha 0.65	Communication with parents is key in influencing children's self-efficacy among young school-based adolescents.
11. **Dancy 2014** HIV risk reduction intervention for rural adolescents in Malawi	Adolescents 13-19 Baseline 499 adolescents Follow up 777 adolescents	Study evaluated the impact of the Mzake ndi Mzake Kuunikira Achinyamata intervention using pre and post survey instruments	Self-efficacy for safer sex (6-items) (a= .81) Self-efficacy for condom use (1-item)	Mean self-efficacy for condom use and safer sex self-efficacy was higher among males and for both males and females improved significantly with intervention (in 13-15 year olds and 16-19 year olds)
12. **Chirinda & Pelzer 2014** Examined the factors associated with inconsistent condom use	2138 sexually experienced youth 18-24 in South Africa	Results present data from a population-based household survey to examine correlates of inconsistent condom use with last sexual partner	Partner risk reduction self-efficacy (Hanna, 1999; Sayles 2006) Cronbach alpha 0.73(4-items)	Univariable model showed females with low relationship control and low self-efficacy associated with inconsistent condom use (OR=. 76[.61-.94]). Multivariable found low self-efficacy (OR=1.10[1.03-1.18]) associated with inconsistent condom use Males and females had similar levels of risk-reduction self-efficacy

13. **Boafo et al 2014** Dating Violence and Self-efficacy for delayed sex among adolescents in SA	3655 school-going adolescents 12-17	Using data from the SATZ program Dating Violence = Main outcome (Cronbach Alpha= .84 for combined)	Delayed sex self-efficacy measuring (ability to wait before having sex, refusal of sex, and avoiding situations that may encourage one to have sex (8-items) developed for the SATZ study (Cronbach Alpha= .79)	Females had higher self-efficacy for delayed sex compared to males. Did not measure if delayed sex self-efficacy predicted sexual abstinence or sexual inactivity Those not perpetuating or experiencing dating violence had higher self-efficacy.
14. **Awotidebe 2014** Determine HIV risk factors in SA AYA	430 secondary school students 13-18 sexual active and inactive (47.4% boys and 52.6% girls)	Study aimed to determine predictors of risky sexual behaviour in rural adolescents participating in a sports-based intervention on HIV-related risky sexual behaviours	Self-efficacy to refuse sex scale based off of Basen-Engquist et.al -4-tems-5 point Likert scale- (for both sexually active and inexperienced learners) Cronbach alpha 0.82 vs. 0.7 previously reported in Basen-Engquist et al., 1999	Girls had higher self-efficacy compared to boys Higher sexual refusal self-efficacy was not associated with sexual activity, early sexual initiation or condom use. Increasing self-efficacy seems to be easier to increase in sexually inexperienced vs. those who are sexually active Suggestion: self-efficacy should be fostered in adolescents pre-sexual debut
15. **Aderemi 2013** Sexual abstinence and HIV knowledge in school-going adolescents with intellectual disabilities and non-disabled adolescents in Nigeria.	300 disabled and 300 non-disabled learners in Nigeria aged 12-19	To test the I-Change model of behaviour change for sexual abstinence among disabled and non-disabled adolescent learners in Nigeria	Three item self-efficacy to abstain from sexual intercourse scale (no reference) Cronbach alpha= 0.68	Self-efficacy to refuse sex was associated with sexual abstinence among learners with low to moderate disability.

16. **Rijsdijk 2012** Correlates of delayed sexual intercourse and condom use among adolescents in Uganda	1978 school-going Ugandan Adolescents Aged 12-20 (885 boys and 1093 girls)	Cross-sectional survey of secondary school adolescents Dependent Variables included: intention to delay sexual intercourse: - Attitudes towards delayed sexual intercourse (2 items r=. 31) Perceived social norms (2 items r= .22 p<. 01)	Self-efficacy to delay sexual intercourse (2-items, p<. 01) Self-efficacy for condom use (r=. 32, p<. 01) For me, using a condom every time I have sexual intercourse is difficult for me I am sure I can use a condom every time I have sexual intercourse	Predictors of condom intention differed significantly for those who have and have not had sexual intercourse. Intention to use a condom was positively associated with condom use self-efficacy. Among those without previous sexual experience self-efficacy to use a condom were positively associated with the intention to use a condom (This was not the case for sexually experienced adolescents)
17. **Puffer 2012** Orphan Status and HIV risk behaviour	325 adolescents aged 10-18 in Kenya	Cross-sectional survey Study main outcome= to examine the wellbeing and sexual related variables of orphans in Kenya	Intervention analyses developed new self-efficacy related scaled to better suit the young population in the study self-efficacy to refuse sexual advances, self-efficacy to avoid risky situations (5-item, Sayles, 2006, Cronbach, 0.64)	No significant difference in self-efficacy beliefs by gender. Orphans who had low self-efficacy were less likely to have positive communication with their parents.
18. **O'Leary 2012** Moderation and mediation of an efficacious sexual-risk reduction intervention for South African adolescents	1047 Grade 6 learners (558 girls and 499 boys) age 9 to 18 RCT trial of two randomly assigned interventions	Let us protect our future intervention. Main outcome to assess effectiveness of intervention on sexual behaviour	Intervention analyses developed new self-efficacy related scaled to better suit the young population in the study self-efficacy to refuse sexual advances (4-items, Cronbach alpha=0.92), self-efficacy to avoid risky situations (4-items, Cronbach=0.92)	The intervention caused a significantly greater reduction in vaginal intercourse compared to the control group. Self-efficacy to avoid risky situations was shown to be a mediator effect for the intervention, with effects being significantly stronger for females compared to males. (This was not the case for sexual refusal self-efficacy) Participants with stricter parents had higher self-efficacy

19. **Matseke 2012** Correlates of condom use among male and female aged 18-24 in south Africa	2138 sexually active youth in South Africa	Using a socio-ecological model to examine the correlates of consistent condom use (measured through condom use at last sex) among participants of the Love Life intervention	Partner risk-reduction Self-efficacy measured using 4 items (No reference included) (Cronbach alpha 0.73)	Males showed slightly higher RRSE compared to females Partner risk reduction self-efficacy was associated with condom use among both adolescent men and women (Gender analysis)
20. **Louw 2012** Examined factors associated with risk reduction self-efficacy via the impact of the loveLife intervention	"A cross-sectional population-based household survey was conducted with persons of ages 18 to 24 years in four selected provinces in South Africa." Included the same sample as above 1127 men and 1007 women	Examining factors associated with risk reduction self-efficacy as part of an evaluation of the love life program	Partner risk reduction self-efficacy (4-items) Cronbach alpha= .73 (items not listed) Relationship control (4-items) Cronbach alpha=0.81	Males with low self efficacy had less consistent condom use compared to those with higher self-efficacy Multivariable analysis showed: Variables associated with high self-efficacy: Males: having been tested for HIV, concurrent sexual partners, transactional sex partners in life, Low HIV risk perception, difficulty of getting condoms, acceptable to have coerced sex, high relationship control, and participating in 1-2 loveLife face-face programmes. Females: low HIV risk perception, HIV/AIDS stigma, ever used drugs and having life goals were associated with high self-efficacy Descriptively females have higher self-efficacy
21. **Denison 2012** Evaluating peer-education programming in Zambia	2133 8th and 9th grade students (11-28) (Sexually active and inactive)	Study presents data evaluating the effectiveness of youth-led School HIV/AIDS Education Program (SHEP) HIV Knowledge (24 questions) Median score was 19)	Self-efficacy (two items) - Refusing sex and using a condom (no Cronbach)	Intervention group had significantly higher self-efficacy compared to control (No differences in male versus female when interaction was conducted) No difference in ever having sex between groups, condom at first sex Intervention group were less likely to have had sex in the past year and more likely to have had only one partner in their lifetime

22. **Chirinda 2012**	3123 youth aged 18 to 24 interviewed as part of the love life intervention (2072 sexually active youth) 1092 men and 980 women were included in this analysis	Study examined factors associated with early sexual initiation as part of an assessment of the love life intervention	4-item self-efficacy scale Cronbach 0.73 in the sample (Same as Louw and Matseke)	In the univariable high self-efficacy was negatively associated with early sexual debut however this did not hold in the multivariable analysis For females high self-efficacy was associated with earlier sexual debut
23. **Van Rossem 2011** Social approval and condom use	2096, 3536 and 3627 Cameroonian youth interviewed between 2000, 2002 and 2003 respectively aged 15-24	Study examined perceived social approval and condom use among urban youth from Cameroon (survey data from three waves) from the Cameroon Adolescent Reproductive Health Survey	Two items used to measure self-efficacy - whether respondents believed they could avoid AIDS, and whether respondents believed they would be able to convince their partner to use condoms (no scale no Cronbach alpha included)	Self-efficacy had a strong impact on condom use. Respondents who believe they can convince their partners to use a condom report a much higher frequency of condom use and more positive attitudes towards condoms (self-efficacy effect is both direct and indirectly associated with increased condom use.)
24. **Rijsdijk 2011** Evaluation of the World Starts with me intervention Evaluation of comprehensive sex education in school-going adolescents in Uganda	835 intervention vs. 1011 comparison groups Mean age 16.1 48 schools (24 intervention and 24 control)	Multilevel evaluation of a comprehensive sex education programme among adolescents in Uganda Socio-demographic profile of respondents	Self-efficacy towards delaying sexual intercourse (2-items r=. 45) Self-efficacy for condom use (2-tems r=. 32) Self-efficacy in dealing with situations where unwanted sex could happen (6-items a=. 60)	Intervention group scored significantly higher on self-efficacy for using a condom than the comparison group, effect was likely due to a marginally higher mean score on self-efficacy among the intervention group students at post-test and a decrease in the mean score on self-efficacy among the comparison group students. Increase in self-efficacy in dealing with sexual coercion for both intervention and control, but was significantly higher in the intervention group.

25. **Puffer 2011** Individual and family level psychosocial correlates of HIV risk behaviour among youth in rural Kenya	325 adolescents 10-18 in Kenya 158 males and 167 females participating in a school-based sexual health survey	To examine and identify individual and family level correlates of HIV risk behaviour in Kenyan youth	Sex-related self-efficacy was measured with 5-item scale (sex refusal and condom use) (a=. 64)	Sex self-efficacy was significantly related to high-risk sex in bivariate analysis and remained significant in the final model (of high-risk sex) Authors did not find significant gender interaction in their analysis Important to incorporate measures of emotional distress into the analysis as this can impact self-efficacy
26. **Otwombe 2011** Examining factors associated with willingness to participate in HIV prevention trials in Soweto, South Africa	506 adolescents aged16-18 in South Africa (sexually active and inactive)	Study examines willingness to participate in HIV prevention trials among adolescents	Self-efficacy scale for condom use and sexual risk reduction (5 items a=0.51)	Females reported higher levels of self-efficacy High self-efficacy was predictor of willingness to participate only in the univariable for females In the multivariable WTP in HIV prevention trials like male circumcision was significantly associated with self-efficacy for males
27. **Coffman 2011** Effects of healthwise	Health Wise intervention 2429 students from nine high schools in South Africa	Looking at the effect of the intervention (life skills based HIV prevention education) on self-efficacy overall and by gender	4-item condom use self-efficacy scale Cronbach alpha 0.74 (cites Maydeu-Olivares)	At baseline boys had higher condom use self-efficacy compared to girls Both intervention and control increased self-efficacy
28. **Burnett et al. 2011** Intervention evaluation for youth in Manzini Swaziland	312 students in grade 9 and 11 Intervention vs. delayed intervention 101 males and 103 females Mean age 17	Pre and post test surveys were conducted for an intervention to promote HIV testing	Previously adapted version for condom use and abstinence Each scale had Spearman-Brown coefficient of .72 or greater indicating sufficient reliability Self-efficacy to know your status and your partners status (2 distinct scales) were developed for this study	Intervention had significant effect on self-efficacy (for condoms and abstinence) and HIV knowledge Self-efficacy for testing did not differ between intervention and control group. No "gender" differences reported for the effect of intervention.

29. **Delva 2010** HIV prevention through sport Kenya	454 in the intervention and 318 in the control. Age range 12-24)	Assessing the effectiveness of the Mathare Youth Sport Association intervention	2 questions assessed self-efficacy using two questions with a score range 0-8 based off of Likert Scale scoring	No difference in self-efficacy beliefs found between intervention and control. No gendered stratified analysis conducted
30. **Maticka-Tyndale 2010** A multi-level model of condom use among students in Kenya	3645 (2380 males and 1025 sexually active females) from 160 schools/communities in grade 6 and 7 in Kenya	Dependent variable: Condom use at last sex (This measure has been shown to be a valid proxy from condom use spanning over longer periods)	Behavioural self-efficacy was measured as abstinence (4-items) and condom use self-efficacy (2-items) (.537 and .844)	Males scored higher on condom self-efficacy than did females, however females scored higher on abstinence self-efficacy. For males having higher condom self-efficacy was associated with condom use at last sexual encounter. For females experiencing pressure to engage in sex and higher condom self-efficacy retained their influence on condom use. Abstinence self-efficacy gained significance in the model with lower odds of reporting condom use Females were more likely to report condom use at last sex if they had higher pressure to engage in sex, had lower abstinence self efficacy and higher condom use self-efficacy
31. **Jama Shai 2010** Examining factors associated with consistent condom use among rural women in South Africa	1204 sexually active females 15-26 from baseline Stepping Stones Survey	Using baseline data from the Stepping Stones RCT in South Africa this study looked at factors associated with consistent condom use among sexually active women	Condom use self-efficacy (combined score of two questions) Sexual relationship power Scale (SRPS) (10-item adaptation)[Cronbach alpha 0.73)	Condom use associated with increased condom use self-efficacy. Consistent condom use associated with more equal relationship power between men and women.

32. **Bogale 2010** condom use among low literate young women in Ethiopia	200 females 13-24 in Ethiopia	Examining the psychosocial determinants of condom use among adolescents taking a community based questionnaire in Ethiopia	Sexual Self-efficacy was measured with six-items (a=0.98)	Regression analyses indicated that condom attitudes, and self-efficacy were significantly related to intended condom use. Significant difference in psychosocial determinants and condom use between females that use condoms and those that don't. Those that used condoms perceived higher HIV vulnerability, higher response efficacy, positive attitudes to condoms, positive subjective norm and higher intention to use condoms. In the regression analysis self-efficacy and intended condom use were not significantly related to actual condom use.
33. **Schaalma 2009** Correlates of intention to use condoms among sub-Saharan African youth	15, 782 secondary South African and Tanzanian Aged 12 to 15	Using the contract of the TPB to examine determinants of condom use intentions among youth involved in the SATZ study	Condom use Self-efficacy (11 items a=0.92) (reference Mukuma 2009 for the development of the scale items)	Classic TPB variables related to condom use (attitudes, norms and self-efficacy) accounted for 77% of the variance in intention to use condoms
34. **Mathews 2009** Predictors of early first sexual intercourse	2360 students 1440 students included in this analysis Mean age= 13-14 in Cape Town South Africa	This analysis was a part of the SATZ study using constructs of the TPB and structural equation modelling to examine factors associated to early first sexual intercourse	Self-efficacy as regards saying no to sex (8-items) a=. 79 (Mukuma 2009 is a reference for the scale development)	Transition to sexual debut was associated with being male, poor self-efficacy to negotiate delayed sex and intimate partner violence No significant gender differences main outcome, therefore gendered analysis was not conducted Transition for first sexual intercourse was negatively associated with self-efficacy with regard to negotiating delayed sex

35. **Kabiru 2009** Correlates of condom use among male high school students	931 sexually experienced male high school students in Kenya	Analysis was conducted in 2004 investigating the sexual behaviour of 3612 students in Kenya	Condom use self-efficacy (a= .89) 19 items (5-point likert scale) (reference Mahoney 1995 condom use scale) Consistent condom users measured as: same number of partners as number of condoms used vs. sporadic users vs. nonusers	Frequency of condom use was low (47.3% non-users) Nonusers were significantly more likely to be of lower SES< declare religion as very important, report fewer sexual partners, and indicate that the last sexual intercourse was with a non-romantic partner rather than a girlfriend Consistent users reported the highest condom self-efficacy and had more positive attitudes towards condoms
36. **Dlamini 2009** Gender factors associated with sexual abstinent behaviour of rural South African high school going youth in South Africa	454 Grade 9 students (14-20) from 10 randomly selected schools	Using a cross-sectional survey conducted in Zulu in 2004 Dependent variable= sexual abstinence	Used I-Change model to investigate the different constructs of attitudes (a=. 78), social influence s (a= .68), self efficacy for abstinence (a=. 82)(6-items) and intentions (a=. 76) about sexual abstinence	Significantly more males than females have ever had sex and age of first sex was significantly younger among boys compared to girls Abstaining girls felt more confident than non abstaining girls to abstain from sex when pressured by their partners Non-abstaining girls reported higher self-efficacy levels than boys, but not when pressured by their partners Girls held stronger intentions to abstained compared to boys No statistical difference in levels of sexual abstinence self-efficacy between abstaining and non-abstaining girls and boys

37. **Ezeokana 2008** Evaluating an HIV/AIDS prevention program in Nigeria	147 adolescents 15-25	Looked at factors associated with condom use (measured using a condom use subscale) among participating a the HIV-intervention developed by the Anambra State Action Committee on HIV/AIDS (ANSACA)	Perceived self-efficacy (cited Gilmore et al., 1997) and (Ezeokana & Nnedum 2007) Cronbach alpha for the scale = 0.82 (5-point likert scale)	Results found higher self-efficacy to be significantly associated with condom use. No gender analysis was conducted.
38. **Cupp 2008** Alcohol and HIV prevention programmes in South Africa	1095 9th aged 13 to 18 grade students from Pietermaritzburg	Examining the impact of the HIV and alcohol prevention intervention "Our Times, Our Choices"	Methods of the scales were described in Karnell 2006. Condom use self-efficacy (5-items) range 1-5 Cronbach alpha= .77	Intervention was successful at increasing sexual refusal self-efficacy however not on condom use self-efficacy. Intervention effects were stronger for determining initiation of first sex for females and for sexual refusal self-efficacy for males.
39. **Boileau 2008** Monitoring HIV risk and evaluation interventions among young people in urban West Africa (Mali)	531 Young men and women 15 to 24 (267 women and 264 men)	This study assess content and construct validity of scales for the TPB as part of a gender research component of the West Africa Project to Combat AIDS and STIs (WAPCAS), a Canadian cooperation	The perceived behavioural control scale developed for this study (11-items) was based off of previously developed condom use self-efficacy scales (Brafford & Beck, 1991 & Hanna, 1999) and sexual refusal self-efficacy (Cecil & Pinkerton, 1998) (Cronbach alpha= .89)	Women had lower perceived behavioural control in this sample. Sexually active youth had higher perceived behavioural control. Perceived behavioural control predicted condom use among both men and women.

40. **Bhana 2008** Gender role attitudes and sexual risk among adolescents in South Africa	2195 Males and Females 13-18	Using data from the HIV and alcohol prevention program in Pietermaritzburg to examine gendered factors associated with gender role attitudes	Condom use self-efficacy (4-items) Cronbach alpha 0.817 and 0.775(pre and post test) for cohort 1 and 0.701 for cohort 2 Condom negotiation alphas of 0.791 and 0.755 were recorded for cohort 1 and 0.707 and 0.727 for cohort 2	Gender role attitudes mediated the effect of condom use at last sex for girls, however not self-efficacy or condom negotiation.
41. **Adedimeji 2008** Social support and condom use behaviour among young urban slum inhabitants in SW Nigeria	448 sexually active boys and 338 sexually active girls 15-24	Survey measured the correlates of condom use among sexually active youth from 8 slum communities in the NE and SE local government area of Ibadan.	Questions surrounding self-efficacy include: Refuse sex without a condom Use condom properly Use condom always Confidence to buy condoms	Younger males and females were more likely to use condoms. Descriptively males had higher sexual self-efficacy compared to girls older girls had higher self-efficacy compared to younger girls. Condom use self-efficacy was not included in the multivariable modelling
42. **Taylor 2007** reasons for inconsistent condom use by rural South African high school students	353 sexually experienced students (249 males and 104 females) 353 sexually experienced grade 10 students (mean age 16.94)	Cross-sectional survey of 28 schools in Kwazulu natal (KZN) to examine factors associated with condom use at last sex. Study based on the I-Change Model which included behavioural questions	Condom use self-efficacy (10-item) two factors including self-efficacy under ordinary circumstances and the second for specific situations (e.g. when drunk) Cronbach alpha = .81	Males initiated sex much younger than females and males were more likely to use condoms at last sex Increased condom use self-efficacy was found among students who used condoms at last sex Fewer female students were sexually active and no gender difference was found for consistent condom use or with regular partners Majority of students intended to use a condom at last sex. Being male, older age, and self-efficacy to use condoms was positively associated with condom use

43. **Slonim-Nevo 2007** Child abuse and AIDS related knowledge, attitudes and behaviour among adolescents in Zambia	3360 adolescents 10-19 from urban and rural Zambia (2160 attended school and 1200 did not)	Using survey data collected between 1997 and 1998 Purpose of the study was to understand intra-familial child and adolescent physical and sexual abuse among adolescents in Zambia	Self-efficacy about preventing AIDS (20 items a= .79) (Koopman and Rotheram-Borus 1990)	None of the self-efficacy variables were significantly associated with family abuse in multivariable analysis. As levels of abuse increased, self-efficacy regarding HIV/AIDS decreased
44. **Njau 2007** Influence of peers on sexuality and condom use	526 respondents 15-24 from Tanzania	Descriptive cross-sectional study of rural youth	Self-efficacy in sexual relationships (5-items a= 0.68) Self-efficacy on intention to use condoms (7 items a= 0.82)	High Self-efficacy did not predict condom use at last sex or intention to use condoms. High sexual relationship self-efficacy associated with ever having sex. Most youth did not use a condom at last sex despite high self-efficacy.
45. **Maticka-Tyndale 2007** Quasi-experimental evaluation	160 girls and 160 boys from 24 schools 11 to 16 years	This study reports on the impact of a school-based educational initiative in Kenya "Primary School Action for Better Health (PSABH) Pre and post program surveys Questionnaire was developed based on the WHO/UNESCO HIV prevention evaluation kit	Abstinence and condom use self-efficacy was measured with one question for abstinence and 3 questions for condom use	In general abstinence self-efficacy was poor and those who have and have not had sex responded differently to questions regarding abstinence self-efficacy. Gains in abstinence and condom use self-efficacy for girls were highest among those who were sexually active at baseline. Gains in abstinence self-efficacy was only found among those who had high program exposure For boy's program exposure was associated with increase in abstinence self-efficacy. No evidence for program effect on condom use for girls, inverse relationship was found that condom self-efficacy decreased among girls exposure to the intervention. Focus groups point out that those who have had experience with using condoms in sexual situations may better understand the difficulties that come along with

				introducing condom use. Boys demonstrated more gains in condom self-efficacy compared to girls. Program exposure was associated with increases in condom use for boys
46. **Jemmott 2007** Theory of planned behaviour predictors of intention to use condoms among Xhosa adolescents in South Africa	390 Xhosa-speaking black adolescents (149 boys and 241 girls) 10-16 recruited from 6th grade classes in 4 public schools	Using cross-sectional data to examine the factors associated with intentions to use condoms	Perceived behavioural control was assessed using two items (5-point Likert scale)	Multivariable regression revealed that perceived behavioural control was an independent predictor of intention to use condoms. The predictive power of the TPB was not significant by gender
47. **Hendriksen 2007** Examined the correlates of consistent condom use in sexually experienced AYA	7686 15-24 AYA in SA using Reproductive Health and HIV Research Unit National Youth Survey	Using data from a 2003 household survey (the largest ever conducted in South Africa) Examined factors associated with condom use at last sexual encounter	Condom use self-efficacy (4-tem) Cronbach alpha = .6	Males and Females more likely to use condoms consistently (at last sexual encounter) with higher condom use self-efficacy scores (P<. 001). Males had higher mean self-efficacy score compared to females.
48. **Guiella 2007** HIV/AIDS and Sexual-risk behaviours among adolescents	5955 adolescent 12-19 from Burkina Faso,	Using a national adolescent sexual and reproductive health survey conducted in 2004 to examine the relationship between attitudes towards condoms and type of sexual partner on actual condom use at last sex	Self-efficacy measured using one question for males and females separately	Males and older adolescents had higher confidence in getting their partner to use a condom. Females who felt very confident they could get their partner to wear a condom had 6 times the odds of using a condom compared to those who didn't feel confident. Males had 27 times the odds Older females felt more confident that they could get their partners to use a condom.

49. **Ajuwon 2007** Quasi-experimental study assessing the effectiveness of teacher instructions and peer education compared to control in Nigeria	230 adolescents per treatment arm and 42 students from each participating class was selected Range 10-25 men = 16	Study assessed the effects of peer education, teacher instructions and a combination of the two on reproductive health knowledge (the West African Youth Initiative) Schools were randomized into four treatment groups 1. Teacher led, 2. Peer led, 3. Combination, 4. Control	Perceived self-efficacy was measured by asking students to determine their perceived confidence to request for, buy, or use a condom (No Cronbach provided)	Those in the peer intervention had higher self-efficacy at baseline. Intervention schools showed increased HIV knowledge at follow-up. Gains in self-efficacy were witnessed in intervention schools with those in the combined intervention showing the most increase in scores. Those in the peer intervention showed the most significant increased in sexual activity. Those in the combined intervention had an increase in condom use compared to the other interventions. Intervention had positive effect on knowledge and self-efficacy but not actual sexual practice
50. **Sayles 2006** Examining factors associated with self-efficacy for youth	7409 sexually active south African youth 15-24	Used a large sample of sexually active adolescents from a national youth survey to examine factors associated with High sexual self-efficacy	Sexual self-efficacy 5 questions from previously validated scale (Cronbach alpha of 0.64 for women and 0.60 for males) Relationship control items from SRPS (Cronbach alpha= 0.69) (4-questions)	In females factors associated with high self-efficacy= Knowing how to avoid HIV, having spoken with someone other than parent about HIV, having life goals. Factors associated with low self-efficacy= Not using condoms during first intercourse, history of unwanted sex, believing that condoms imply distrust. Males determine to have high self efficacy were more likely to take HIV seriously, believe they are not at risk of HIV, reported high accessibility to condoms, and had life goals. Low self-efficacy in males was associated with not using a condom at first sexual experience, history of unwanted sex, believing condoms to be a sign of mistrust, and refusing to be friends with an HIV infected individual.

51. **Karnell 2006** Pre-test posttest for alcohol/HIV prevention	661 Grade 9 students Mean age 16	This study evaluates the effectiveness of Our times, Our choices intervention (A pilot study) of a alcohol reduction intervention	Sex refusal self-efficacy (6-items)-Based off of Cecil & Pinkerton (1998) (Cronbach alpha .86) Condom use self-efficacy (1995) 5-itmes Based off of Brien, Thombs, Mohoney, & Wallnau (1994)(Cronbach alpha .77)	Female Students in the intervention group increased their sex refusal self-efficacy. Condom use self-efficacy was not significant in post intervention (there was no difference in condom use self-efficacy in the different intervention groups).
52. **James 2006** The Impact of an HIV and AIDS Life Skills Program on Secondary School Students in KwaZulu-Natal, South Africa.	1141 Grade 9 students from 22 allocated schools (15-21) in South Africa	This study evaluates the effectiveness of the life skills intervention (RCT) Questioners were given at three separate time periods	Six statements regarding "confidence to assert oneself" (5-point Cronbach alpha = 0.77)	Little results demonstrated for sexual behaviour and psychosocial determinants from intervention group In the short and long term those in the intervention gained knowledge no other gains observed through the intervention (no self-efficacy gains in the intervention group). This null effect may be due to how schools implement the intervention groups where intervention was fully implemented had less sexual activity and reported more condom use in the 6 months following the intervention. Authors discuss how skill building is needed in addition to knowledge in order for change to occur.

53. **Dawood 2006** Knowledge, attitudes and sexual practices of adolescents with mild retardation, in relation HIV/AIDS	90 14-16 year old adolescents with mild mental retardation in Durban South Africa	Using survey data from a questionnaire conducted among adolescents enrolled in full-time study at a prevocational school for pupils with learning problems	Reliability of the scales for prejudice regarding HIV/AIDS, peer norms, and self-efficacy were marginally poor (Cronbach alpha ranged from 0.417-0.4841) Scale had four items 1. I can tell my girlfriend/boyfriend that I don't want to have sex 2. I find it difficult to ask my sexual partner to use a condom 3. If I asked my sexual partner to use a condom, he/she will disagree 4. I am too embarrassed to use a condom	Self-efficacy scale Cronbach was marginally poor (0.42-0.48) self-efficacy was correlated with the "threat" scale. Higher perceptions of threat was associated with higher self-efficacy Sample had a high reporting of self-efficacy to refuse sex and negotiate condom use. Did not measure the association between condom use and sexual self-efficacy.
54. **Bryan 2006** Model of condom use intention to use condoms	261 adolescents (9th and 10th grade) (aged 11-17) in South Africa	Structural Equation modelling to test the theory of planned behaviour with augmented constructs such as gender and sexual activity on intention to use condoms over two time periods	16 -item Condom use self-efficacy scale (Brien et al., 1994) Cronbach alpha .72	Significant association from attitudes, norms and self-efficacy to intentions. Positive outlook associated with self-efficacy Results indicate that young women have higher control over condom use. Higher Control over the sexual encounter (which had a low internal consistency) was positively associated with condom use intention for girls (but not significant) and negatively associated with condom use intentions for boys (PBC)

55. **Slonim-Nevo 2005** AIDS-related Knowledge, attitudes and behaviour among adolescents in Zambia	3360 adolescents 10-19 in Zambia	This study examined AIDS related knowledge, attitudes and behaviour among in and out of school adolescents in Zambia	Self-efficacy for HIV prevention (based off of Koopman and Rotherman-Borus 1990 scale) 20 items a= .79	Females had higher knowledge about AIDS, however males had higher self-efficacy. Males had higher likelihood of STI, sexual intercourse and unprotected sex. Out of school and rural adolescents more likely to experience sex and have intercourse while intoxicated. High self-efficacy was significantly more likely among older adolescents, males, urban, unmarried and those with higher socio-economic status. Higher knowledge was associated with higher self-efficacy. Positive attitudes were associated with higher self-efficacy. Knowledge attitudes and self-efficacy are not linear. These variables explained 9.4-18% of the variance after controlling for socio-demographic variables. Low efficacy, attitudes and knowledge predicted high risk behaviour however these variables only predicted about 3.2% of the variance.
56. **Magnani et al 2005** The impact of life skills education on adolescent sexual risk behaviours in KwaZulu-Natal, South Africa.	Examining the impact of an extensive life skills intervention where: " Data come from a panel study of 2222 youth from several population subgroups in KZN. The youth were aged 14–24 years when interviewed in 1999 and 2001. "	Study examines the impact of participation on an intervention.	Self-efficacy measured only using two question looking at ability to obtain condoms and use them effectively.	Males and older youth had higher self-efficacy than females and younger youth. Confidence self-efficacy and effective use self-efficacy improved with intervention. Self-efficacy index found to be significant for condom use among males but not females.

57. **Pettifor 2004** Explored the effects of sexual power in HIV status and condom use among South African adolescent women	Analyses includes 4066 sexually experienced young women through a 2003 household survey	Outcome of interest was HIV serostatus	Condom use self-efficacy was also measured: Moderate internal consistency (Cronbach alpha= 0.60) Pilot was performed to choose the measures from the original SRPS that were most accurate for South African context. Moderate internal consistency (0.69)	Those with low condom use-self-efficacy were at increased risk of inconsistent condom use although in the final model, after controlling for factors such as relationship control this did not remain significant. Low relationship power associated with inconsistent condom use (AOR 2.1-[1.17-3.78]) This is significant as inconsistent condom use was associated with HIV infection (AOR 1.58[1.10-2.27}).
58. **Karim 2003** Reproductive health risk and protective factors among unmarried youth in Ghana.	3739 unmarried youth 12-24 in Ghana	Using data collected from a national representative survey to examine sexual risk-taking among unmarried Ghanaian youth Demographic characteristics	Self-efficacy in relationships (9-items, a=. 88) Condom use self-efficacy (7-items, a=. 83) Self-efficacy in partner communication (2-tems, a=. 71)	Low levels of multiple partnerships (4% of females and 11% of males). 24% of sexually experienced males and 20% of sexually experienced females reported condom use. Authors suggest that control over sex may be a significantly different matter than control over using a condom. Condom use and partner communication self-efficacy highly related to condom use during last sex (for both genders). Greater levels of self-efficacy in condom use predicted condom use at first sex for males.

59. **Taffa 2002-** Psychosocial determinants of sexual activity in Ethiopian youth	561 in and out of school youth (15-24)	The study examined aims to describe the psychosocial determinants of sexual activity and condom use intentions among Ethiopian youth	Perceived self-efficacy for sexual negotiation (6-items, a= 0.7)	Self-efficacy predicted 23% of variance of intention to use condoms and was associated with condom use at last sexual encounter. Females have significantly higher mean score of self-efficacy compared to males. Those who have not had sex have significantly higher levels of self-efficacy. Females reported lower levels of condom use and sex than males. Self-efficacy predicted condom use at last sex for both males and females. Younger adolescents had higher mean self-efficacy scores. Females had significantly higher self-efficacy compared to males.
60. **Meekers and Klein 2002** Determinants of condom use among young people in urban Cameroon.	1102 Youth from Cameroon 15-24	Study examines the effect of exposure to condom advertisement by gender	Authors did not provide Cronbach alpha but did provide condom use self-efficacy scale items and answered (yes vs. no/probably no) by gender (10-items)	Males have higher on average condom use self-efficacy. Self-efficacy for negotiating condom use quite high within this sample. Self-efficacy varies according to partner type. Perceived self-efficacy may not completely translate into action. Females significantly more likely to ask their partner to use a condom. Parental support to buy condoms associated with reduction in shyness. Parental support associated with confidence in condom use skills but not peer support Skills to use condoms associated with prior condom use.
61. **Babalola 2002** Correlates of safe sex among Rwandan youth	1322 (533 males and 790 females) aged 15 to 24	This study aims to understand correlates of safe sex using a "positive deviance approach"	Examined three questions related to sexual refusal self-efficacy (citing a number of different theoretical models) And one question regarding perceived self-efficacy to use a condom every time	For males perceived self-efficacy to refuse sex with someone known for more than 3 months was the only self-efficacy variable that has significant effects on abstinence for boys. Perceived self-efficacy to refuse sex with someone you truly love was the only predictor of abstinence among girls. Perceived condom use self-efficacy was

				significant for using a condom (among both men and women) (although marginal).
62. **Adih 1999** Determinants of Condom use to prevent HIV infection among youth in Ghana	601 young men aged 15-24	Outcome measure examined correlated of lifetime consistent condom use and condom use at last sex	Perceived self-efficacy to use a condom based off of Basen-Enguist and Parcel scale (range 4-16) Cronbach alpha 0.73)	High self-efficacy was associated with lifetime condom use and those with high condom use self-efficacy and low perceived barriers to condom were more likely to have used condoms at last intercourse. Self-efficacy was the strongest predictor of condom use.
63. **Abraham 1995** Questionnaire to measure theoretical specific variables in Uganda	387 respondents (mean age 18.8)	Questionnaire conducted among secondary school students in 25 secondary schools to examine the acceptability of people living with HIV	Combination of 5 different self-efficacy constructs to make a "sexual discussion self-efficacy" (Cronbach alpha=0.62)	Gender differences in self-efficacy are important and highlighted here. For women, self-efficacy was predicted by perceived condom effectiveness and for men embarrassment was predictive of condom use self-efficacy. Psychosocial variables were better about to account for condom use intentions amongst women than young men. Condom use-self-efficacy did not predict condom use intentions among men.

Appendix D.
Results from the Principle component analyses presented as explanatory variables within the analysis

Table D 1 6-item Positive Condom Use Belief Scale (Cronbach alpha= 0.86)-

	Factor-1
1. Condoms are a good way to help stop AIDS and other sexually transmitted diseases.	0.67
2. Condoms are safe to use.	0.74
3. Using condoms is the responsible thing to do.	0.85
4. I and my partner are less likely to get AIDS or other sexually transmitted diseases.	0.65
5. Using a condom shows you care about yourself and your partner.	0.77
6. If I used condoms, my partner would respect me.	0.64

Table D-2- 14-item Negative Sexual Relationship Beliefs Scale

Sexual Belief Questions	**Factor1 (21-items)**	**Factor1-sub (14-items)**
1. It is more difficult to refuse sex with a partner who is older than you compared to a partner who is the same age as you.	0.17	
2. Condom use is a shared responsibility for both partners.	0.16	

3. It is cool to have a sexual partner who is older than you (5+ years).	**0.36**	**0.33**
4. It is okay to have sex with a sugar mommy, sugar daddy, or a person with whom you have sex so that they will buy you things.	**0.41**	**0.38**
5. Using condoms is a sign of not trusting your partner.	**0.37**	**0.36**
6. It is against my values for me to have sex while I am still a young person.	0.12	
7. It is okay to pressure someone into have sex when they do not want to.	**0.46**	**0.46**
8. It is okay to have many sexual partners.	**0.44**	**0.44**
9. It is okay to have sex with my partner even though my partner does not want to.	**0.53**	**0.53**
10. It is okay to have sex when I do not want to but my partner insists on having sex.	**0.52**	**0.51**
11. It is okay for people my age to have sex.	0.25	
12. In the future I want to be married or in a long-term relationship in which my partner and I only have sex with one another (a monogamous relationship).	0.14	
13. Oral sex is not sex.	0.16	
14. I have had dry sex, or I know people who have had dry sex. By dry sex we mean that before sexual intercourse, the vagina is dried	**0.44**	**0.44**

with herbs or detergents.		
15. Condoms carry viruses/diseases such as HIV/AIDS.	**0.42**	**0.42**
16. Sex is pleasurable.	-0.08	
17. It is cool to have a boyfriend/girlfriend who is younger that you (5+ years).	**0.34**	**0.33**
18. It is okay to hit your boyfriend/girlfriend when you are angry with them.	**0.44**	**0.45**
19. It is okay to force your boyfriend/girlfriend to have sex when you are angry at them.	**0.58**	**0.60**
20.It is okay for my boyfriend/girlfriend to hit me when they are angry at me.	**0.50**	**0.51**
21. It is okay for my boyfriend/girlfriend to force me to have sex with them when they are angry at me.	**0.63**	**0.65**
	Overall	**Sub**
Cronbach's alpha	0.70	0.77

Table C 2

Bolded items were included in the final scale