PERCEPTIONS OF SEXUAL PARTNER SAFETY

by

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Abstract

This methodological study was designed to examine the degree to which relationship characteristics and sexual partner attributes influenced heterosexual adults' assessments of their sexual partner's STI/HIV risk, and how this assessment affected condom use. A secondary aim of the study was to examine relationships among factors that may have influenced an individual's STI/HIV safety beliefs, his/her own perceived STI/HIV risk, frequency of condom use, and demographic and background factors.

A cross-sectional correlational survey design was used in this study. The study was conducted in the fall of 2004 at the British Columbia Centre for Disease Control's Sexually Transmitted Disease Clinic. Systematic nonprobability sampling was used resulting in 317 clients who were eligible and agreed to participate in the study. An investigator designed structured self-report questionnaire was developed and used to collect data for this study. The survey included questions to assess the endorsement of STI/HIV safety beliefs when considering sexual partners in general and when considering a specific sexual partner. Questions also addressed an individual's own perceived STI/HIV risk, perceived STI/HIV risk of a specific partner, general condom use, and first time condom use with a specific partner. Descriptive statistics were used to describe the level of endorsement of STI/HIV safety beliefs. Multiple linear regression was used to determine the influence of demographic and background factors on STI/HIV safety beliefs. Bivariate correlation examined the relationships between perceived STI/HIV risk and condom use.

STI/HIV safety beliefs findings indicated that a high percentage of individuals are relying on relationship characteristics and partner attributes to determine STI/HIV safety when considering sexual partners in general and when considering a specific sexual partner. Those beliefs most frequently endorsed were related to perceptions of familiarity, trust, and the feeling

that one “knew” the partner’s sexual history. When comparing the level of endorsement of beliefs in relation to sexual partners in general and in relation to a specific sexual partner, significant differences were found suggesting that individual beliefs are influenced by context and the dynamics of the social relationship.

Results of two multiple regressions showed that age, general condom use, number of sexual partners in the last six months, and relationship status were significantly related to STI/HIV safety beliefs when considering sexual partners in general. However, no significant demographic and background predictors were identified when considering STI/HIV safety beliefs in relation to a specific partner.

In considering the emerging literature that suggests the perceived STI/HIV risk of the partner is more influential than an individual’s own perceived STI/HIV risk, it is surprising that own perceived STI/HIV risk was the only variable significantly associated with STI/HIV safety beliefs and condom use. These findings indicated that as an individual’s own perceived STI/HIV risk decreased, endorsement of STI/HIV safety beliefs increased. Moreover, as own perceived STI/HIV risk increased, condom use also increased.

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Dedication

This thesis is dedicated to Mike, for being an example of someone who truly lives according to his life's philosophy, and for believing that all things are possible (even when they seem like they are not). Thank you!

CHAPTER 1: INTRODUCTION

Heterosexual transmission of human immunodeficiency virus (HIV) has increased steadily over the last two decades (Health Canada, 2000; 2003a) and current evidence indicates that other sexually transmitted infections (STI's) such as chlamydia, gonorrhea, syphilis, genital herpes, and genital warts are increasing and widespread (Centers for Disease Control and Prevention [CDC], 2000; Health Canada, 2000). In the United States (US) it has been estimated that 15 million people become infected with one or more STI's each year and that in the year 2000, more than 65 million people were living with an incurable STI (Cates, 1999). In Canada, the incidence of STI's has been steadily rising since 1997 with serious health and economic consequences reported (Health Canada, 2003b). Although statistics indicate that STI's are prevalent, of significant concern is the fact that many individuals remain unaware of their infection status because they are asymptomatic. When left undiagnosed and untreated, STI's have the potential to produce serious and sometimes fatal consequences with women often facing a disproportionate burden of sequelae from STI's (e.g. pelvic inflammatory disease, infertility, chronic pelvic pain, ectopic pregnancy, cervical cancers). In 1990, the estimated direct and indirect costs of chlamydial infection in Canada alone were as high as \$115 million dollars (Health Canada, 2003b). In addition, evidence now implicates STI's as a cofactor in HIV transmission (CDC, 2000; Health Canada, 2000) which increases the magnitude of the STI problem, and poses a significant public health challenge for Canadians.

Over the last two decades, sexually transmitted infection (STI) prevention efforts have been based on the assumption that increased perceptions of risk motivate individuals to adopt self-protective or safer sexual behaviours. Behaviours promoted as the most effective in preventing STI/HIV transmission have included sexual abstinence, consistent use of latex condoms, and refraining from sex with infected partners. Despite current prevention efforts, many individuals continue to engage in high-risk sexual behaviours (Federal, Provincial and Territorial Advisory

Committee on Population Health [FPTAC], 1999; Fishbein, Douglas, Rhodes, Hananel & Napolitano, 1993). Recent research suggests that many individuals are choosing a *version* of the latter option; refraining from sex with infected partners by selecting partners they believe are “safe” or uninfected (Clark, Miller, Harrison, Kay & Moore, 1996; Hoffman & Cohen, 1999). A limited but growing body of research indicates that many people believe they intuitively “just know” whether a partner is safe (Hammer, Fisher, Fitzgerald & Fisher, 1996; Keller, 1993; Maticka-Tyndale, 1991; Misovich, Fisher & Fisher, 1996; Skidmore & Hayter, 2000; Swann, Silvera & Proske, 1995) and that these intuited perceptions of partner safety are based not on definitive evidence of STI/HIV infectivity, such as STI test results, but on other less reliable factors, such as relationship type (known versus unknown or casual versus steady partners) and partner attributes (personality and physical characteristics of the sexual partner). Although the majority of STI’s are transmitted within the context of a relationship, few studies have investigated relationship influences on sexual decision making. Further research is required to investigate the influence of interpersonal relationship factors and partner attributes on an individual’s perceived STI/HIV risk and the role these factors play in sexual decision making.

Background

Sexual transmission of HIV occurs through the exchange of infected blood and body fluids. To prevent HIV transmission, individuals must avoid behaviours that place them at risk, such as engaging in unprotected sex. To date research has failed to explain why many individuals continue to place themselves at risk by engaging in unprotected sexual intercourse. One explanation put forward concerns the early HIV prevention recommendations made by US Surgeon General Koop (1986) to “know your partner well” and adopt safer sexual behaviours in circumstances involving sex with anonymous, casual, or high risk partners (e.g. sex workers). Some have suggested that this advice has contributed to an increase in risky behaviour because many individuals have misinterpreted these messages to mean that cursory knowledge about a

potential sexual partner is sufficient to judge that partner's STI risk and thereby render safer sexual practices unnecessary (Kelly & Kalichman, 1995; Misovich et al., 1996). Others have asserted that these messages have endorsed stereotypical beliefs (e.g. traits associated with members of a particular risk group) about people at risk for STI's and have therefore encouraged people to believe that they are able to recognize someone with an STI (Conley & Collins, 2002).

Similarly, Fisher and Fisher (1993) and Misovich and colleagues' (1997) identified two components of STI/HIV prevention information previously not addressed in the STI/HIV literature, but which they believe are critical barriers to STI/HIV behaviour change. The first barrier identified involves the use of what these authors refer to as "implicit personality theories" to determine STI/HIV risk. They describe implicit personality theories as a set of assumptions or stereotypical beliefs held about the characteristics or personal attributes of a person infected with an STI or HIV that people use to evaluate a sexual partner's STI/HIV status. Individuals using implicit personality theories to determine STI/HIV risk would believe it is easy to detect risky partners on the basis of how they looked, how they dressed, and how they acted. The second barrier identified by these authors involves the use of inaccurate STI/HIV heuristics. These are described as relatively automatic and cognitively effortless decision-making rules that individuals formulate to determine the STI/HIV risk of a partner. These authors point out that the use of these heuristics is problematic because they are often based on incorrect information and therefore result in the formulation of inaccurate heuristics. Three common inaccurate STI/HIV heuristics identified by these authors are: 1) known partners are safe partners, 2) trusted partners are safe partners, and 3) monogamous relationships are safe relationships.

To date, the majority of STI/HIV prevention research has focused on personal behaviour change and has tried to explain behaviour change using several theoretical approaches. These

include the health belief model (Strecher and Rosenstock, 1997), and the transtheoretical model of change (Prochaska, Redding & Evers, 1997). These theories evaluate risk in general terms (e.g. future likelihood of contracting an STI/HIV based on hypothetical risk due to past, present, and future behaviour) and hypothesize that this perception of risk is the primary motivator for the adoption of self-protective behaviour (Fisher & Fisher, 2000; Gerrard et al., 1996). In an effort to create a strong basis for STI/HIV prevention efforts, researchers have explored the link between this perception of risk and self-protective behaviour in the STI/HIV domain however empirical studies have produced inconsistent and therefore inconclusive findings (Albarracin, Johnson, Fishbein & Muellerleile, 2001; Ellen et al., 2002a; Gerrard, Gibbons, & Bushman, 1996; Malotte et al., 2000).

Although STI's are primarily transmitted within the context of a dyadic relationship, only limited STI research has considered the influence of interpersonal dynamics and the specific partner on sexual decision making. Gerrard et al. (1996) and Poppen and Reisen, (1997) argue that it is the relationship one has with a specific partner that influences his or her perceived STI/HIV risk and therefore the types of sexual acts engaged in, and the decisions made about self-protective behaviour. Qualitative studies (Hammer et al., 1996; Hoffman & Cohen, 1999; Offir et al., 1993; Skidmore & Hayter, 2000; Swann et al., 1995; Williams et al., 1992) have consistently shown that an individual's perceived risk of becoming infected with an STI or HIV is related to the perceived STI/HIV risk of a specific sexual partner. In addition, findings from these qualitative studies show that rather than using more objective methods of determining infectivity, such as STI testing, individuals are drawing conclusions about a partner's safety based on the physical characteristics and personality of the specific partner. Personality and personal characteristics commonly cited in the literature include likeability, warmth, kindness, familiarity, trust, appearance, and judgments about how well the partner is "known" (Agocha & Cooper, 1999; Clark et al., 1996; Kendrick, Montello, Gutierrez & Trost, 1993; Skidmore &

Hayter, 2000). Research however has shown that these factors are not reliable sources of information upon which to determine sexual safety (Agocha & Cooper, 1999; Ellen, Vittinghoff, Bolan, Boyer & Padian, 1998). Individuals relying on such characteristics have been shown to underestimate the likelihood of a partner's infectivity and incorrectly conclude that self protective behaviour is unnecessary. Although the majority of literature in this area has emerged from qualitative findings, some quantitative research (Clark et al., 1996; Misovich et al., 1997; Reisen & Poppen, 1999) has been conducted with findings supporting that of the qualitative research. Additional quantitative research is needed however to further substantiate these findings.

Another limitation in the body of STI/HIV literature concerns the populations on which the majority of existing research has focused. These populations have primarily included homosexual men and intravenous drug users as target populations for assessing perceptions of STI/HIV risk. Research in heterosexual populations has been limited to adolescent and college student populations with few studies utilizing adult heterosexual populations at increased risk. Individuals seeking STI services represent an appropriate population for researching STI/HIV risk perceptions because many have not engaged in safer sexual behaviours.

STI/HIV prevention efforts over the last two decades have not been effective in reducing STI/HIV transmission in the heterosexual population. As a growing body of research is indicating that individuals are using information unrelated to STI/HIV prevention messages to assess STI/HIV risk, the aim of this research was to investigate the ways in which relationship characteristics and partner attributes influenced an individual's STI/HIV perception of risk, and the role that this risk perception played in sexual decision-making in an at-risk heterosexual population.

Purpose

The purpose of this study was to determine the degree to which factors related to relationship characteristics and sexual partner attributes influenced heterosexual adults' assessments of their sexual partner's STI/HIV risk, and how this assessment affected their use of condoms. A secondary aim of the study was to examine relationships among factors that may have influenced an individual's STI/HIV safety beliefs, his/her own perceived STI/HIV risk, frequency of condom use, and demographic and background factors. For the purposes of this study, relationship characteristics and partner attributes in relation to STI/HIV safety will be referred to as STI/HIV safety beliefs.

The following research questions were addressed in this study:

1. What STI/HIV safety beliefs are endorsed by individuals when they evaluate the STI/HIV safety of sexual partners in general, and that of a specific sexual partner?
2. How does the endorsement of STI/HIV safety beliefs differ, when applied to sexual partners in general versus a specific sexual partner?
3. How are demographic and background factors related to an individual's endorsement of STI/HIV safety beliefs, when considering sexual partners in general and a specific partner?
4. When considering sexual partners in general, what is the relationship between an individual's endorsement of STI/HIV safety beliefs, his/ her perceived STI/HIV risk, and his/her overall condom use?
5. When considering a specific sexual partner, what is the relationship between the endorsement of STI/HIV safety beliefs, the perceived STI/HIV risk of that partner, and an individual's use of condoms during the first sexual intercourse encounter with that partner?

(See Figure I for the theoretical model)

Definition of Terms

The following are definitions for key concepts employed in this study:

STI/HIV Safety Beliefs: Beliefs about relationship characteristics and partner attributes that are used to determine the STI/HIV safety (uninfected status) of a sexual partner when considering sexual partners in general and when considering a specific sexual partner.

Own Perceived STI/HIV Risk: An individual's overall belief about the likelihood or probability of contracting an STI/HIV, based on hypothetical risk due to past, present, and future behaviour.

Perceived STI/HIV Risk of a Specific Sexual Partner: An individual's belief about the likelihood or probability that a specific sexual partner could be infected with an STI/HIV.

Sexual Partner Attributes: Visible or inferred characteristics of a sexual partner that are used to form an impression of that partner. Examples include physical characteristics (appearance, attractiveness, dress, demeanour), socioeconomic status, likeability, and personality.

Relationship Status: The level of commitment one ascribes to his/her relationship (e.g. committed/uncommitted relationship or steady/casual partner).

Safer Sexual Behaviour: The type of behaviour an individual chooses to engage in to substantially lower the risk of STI/HIV transmission. This behaviour includes condom use for STI prevention.

Figure I. Theoretical Model

CHAPTER 2: LITERATURE REVIEW

A comprehensive search for published literature related to risk perception and sexually transmitted infections (STI's) was conducted using the following databases: Medline, Comprehensive Index of Nursing and Allied Health Literature (CINAHL) and PsycINFO. In addition, relevant literature cited in retrieved publications was identified and retrieved. Searches were limited to English language manuscripts published within the last 10 years (1994 to 2004) although relevant key literature published prior to this period was included. For the purpose of the literature search, the following key words and key word combinations were used: risk perception, sexually transmitted diseases (STD), sexually transmitted infections (STI), safe sex, self-protective behaviour, safer sexual behaviour, partner assessment, partner selection, risk behaviour, sexual behaviour, condoms, human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS).

In this literature review I examine the development of current theoretical perspectives and the significant research findings forming the basis of STI/HIV risk perception knowledge. I begin the review with a discussion of general perceptions of risk as conceptualized in current models of health behaviour. Risk perception conceptualized in this manner considers an individual's assessment of their overall STI/HIV risk when no distinguishable source of risk is actually identified (e.g. considering future likelihood and not based on any specific partner). Factors influencing general perceptions of risk are explored and include: accuracy of risk perceptions and judgmental bias (optimistic bias).

As sexual intimacy and risk taking occurs within the context of a dyadic interpersonal relationship, I also consider an alternate conceptualization of STI/HIV risk which identifies a source of risk, namely that of a specific sexual partner. Discussion then focuses on possible factors influencing STI/HIV risk perception in relation to a specific partner. These factors

include: stereotypical judgment (implicit personality theories), partner attributes (physical attractiveness, appearance), and inaccurate STI/HIV heuristics (known partners are safe partners, monogamous relationships are safe relationships).

Perceptions of Global Risk

Risk perception has long been thought to play a crucial role in influencing health behaviour decision making and has been included as a key component in many of the psychosocial models of health behaviour such as the health belief model and the transtheoretical model of change. In an attempt to curtail the HIV epidemic, STI/HIV prevention efforts over the last two decades have adopted the premise asserted in these models with intervention efforts primarily focusing on providing risk relevant information, and promoting condom use as a means for increasing awareness and reducing STI/HIV transmission. While these models have provided a useful conceptual framework from which to examine self-protective behaviour in less complex health domains, in the STI/HIV domain empirical studies have failed to demonstrate a consistent relationship between STI/HIV risk perception and self-protective behaviour (Gerrard et al., 1996; Poppen & Reisen, 1997; Rosenstock, Strecher & Becker, 1988). Researchers now argue that the application of these theoretical models to HIV preventive behaviour may not be appropriate in understanding STI/HIV risk perception (Ellen, Adler, Gurvey, Millstein & Tschann, 2002a; Reisen & Poppen, 1999).

Current Theoretical Perspectives

Gerrard et al. (1996) and Poppen & Reisen (1997) suggest that because STI's and HIV are communicable diseases, and transmission occurs within the context of an interpersonal relationship, factors related to interpersonal dynamics differentiate STI/HIV risk perception and the adoption of health protective behaviours from other health domains. For example, behaviours and health outcomes in domains such as diabetes and cancer are not necessarily

dependent on decisions influenced by interpersonal dynamics. Gerrard et al. (1996) allege that because interpersonal factors have not been considered in current health behaviour models, the relationship between risk perception and self-protective behaviour may have been attenuated in past research. In their meta-analysis (Gerrard et al., 1996) and in an extensive review (Gerrard, Warner, & Smith, 1993) of the literature, Gerrard and colleagues found that STI/HIV risk perception is most commonly operationalized as a decontextualized cognitive representation of likelihood, for example, asking participants to estimate their subjective likelihood of contracting an STI. Assessing risk perception in this manner is problematic because as these authors assert, the evaluation does not take into account the influence of the social context in which sex occurs, and the interpersonal dynamics with a specific partner. Past studies therefore may not have been sufficiently sensitive and may have underestimated the association between risk perception and self-protective behaviour.

Other researchers (Clark et al., 1999; Ellen et al., 2002b; Fisher & Fisher, 2000; Gerrard et al., 1996; Kelly & Kalichman, 1995; Reisen & Poppen, 1999) agree and further point out that perception of risk in these models is solely concerned with an individual's behaviour and relies on the individual's assessment of his/her overall perceived vulnerability to a threat or the perceived probability that a negative health outcome (disease) will occur (Ellen et al., 2002b). Poppen and Reisen (1997) have suggested that this "individual" approach is not appropriate when considering perceived vulnerability to an STI/HIV because infection is dependent on the infection status of the specific sexual partner and can vary from one partner to another. Research shows that individuals choose to use self-protective behaviour with one partner considered to be high risk but not with another considered to be low risk. This suggests that conceptualizations of STI/HIV risk perception should be based on the likelihood of contracting an STI/HIV from a specific partner rather than on the likelihood of contracting an infection from a hypothetical

partner. Poppen and Reisen (1997) have labelled risk assessments lacking a specific source of risk as “global risk perception” because they are based on hypothetical risk due to past, present, and future behaviour. Reisen and Poppen (1999) argue that a conceptualization of risk which considers a specific partner is a better assessment of the impact of risk perception on behaviour in the sexual context because perception of risk, in relation to STI/HIV, is specific to a particular partner at a particular time. They have labelled this new conceptualization partner-specific risk perception (PSRP).

Accuracy of Perceived Sexual Risk

STI/HIV public health campaigns have long been based on the assumption that people underestimate their risk because they are unaware of the behaviours that put them at risk. Providing risk relevant information to individuals to increase STI/HIV knowledge and awareness levels has therefore been a primary focus of these campaigns. Research findings indicate that although these campaigns have been successful in increasing knowledge and awareness, this knowledge has not translated into a general increased perception of risk or behaviour change (Fisher & Fisher, 1992). For example, Barden-O’Fallen et al. (2004) conducted a prospective randomized study of 1,601 male and female participants aged 15 to 44 years and using multivariate logistic regression found that HIV/AIDS knowledge was not associated with HIV/AIDS risk perception. Similarly, James, Reddy, Taylor and Jinabhai’s (2004) findings indicate that among a sample of 1,113 grade 11 students, high knowledge levels for causes and transmission of STI’s, and high acceptance levels of condoms as a means of protection against STI’s, were not associated with condom use.

Although many studies have identified and focused on epidemiologic predictors of high risk behaviour (e.g. number of sexual partners, previous STI, type of sexual act, protected versus unprotected sex), few studies have considered the accuracy of an individual’s perception of their

own risk behaviour. Despite the fact that the majority of people report they are aware of “risky” sexual behaviours, perceived vulnerability to HIV is often rated low among those reporting they engage in high risk sexual practices (Fisher & Fisher, 1996).

Bauman and Siegel (1987) conducted face to face interviews with 160 asymptomatic gay men and compared their subjective assessments of their sexual risk behaviour with an objective assessment of their behaviour. Objective risk was measured using behaviour classification categories based on epidemiological study findings and risk reduction guidelines. These categories included risky, low-risk, and safe sexual practices. Risky practices were classified as those that permitted the efficient exchange of blood or semen, low-risk as those which probably did not permit the efficient exchange of body fluids, and safe practices as those which provided virtually no opportunity for the exchange of body fluids. The objective findings showed that although 42% of the sample engaged in high-risk sexual activities, only 9% rated their behaviour as high risk (Kendall's Tau = .28, $n = 153$, $p < 0.000$).

More recent studies in other populations further support these findings. In a study examining perceived STI/HIV risk among female adolescents ($n=411$), Kershaw et al. (2003) measured perceived HIV risk with four indices of sexual risk behaviour (condom use, number of high risk partners, number of partners within the last year, and recent history of an STI) and found that 51% of their sample underestimated their sexual risk. Ethier et al. (2003) found similar results when they conducted face-to-face interviews with 209 adolescent females. In their study, participants were tested for chlamydia and gonorrhea every six months for 18 months to determine whether STI risk factors (STI history, unprotected sex, STI symptoms, STI infection) informed perceptions of susceptibility, and to determine the relationship between perceived susceptibility and actual STI diagnosis. Using logistic regression, their findings indicated that no significant differences existed between most STI risk factors and perceptions

of susceptibility. STI history was the only factor found to be a significant predictor of perceptions of susceptibility (OR = 2.61, CI = 1.04 to 6.55, $p = 0.04$). Additionally, most participants (88.9%) perceived little or no risk for an STI despite the fact that 73.8% of the sample reported a previous STI, risky sexual behaviour, or symptoms. Twenty three percent of participants tested positive for chlamydia, gonorrhea or both at baseline, six, or 12 months. Of those testing positive, 81.3% believed there was little or no chance that they would contract an STI during that time. These findings suggest that risk perceptions are not objective evaluations of risk but rather cognitive evaluations of risk that contain significant error. Weinstein (1980, 1984) has labelled this cognitive error “optimistic bias.”

Judgmental or Optimistic Bias

It has been recognized that people tend to underestimate their vulnerability to negative events. This phenomenon has been referred to in the literature as both optimistic bias and unrealistic optimism (Weinstein, 1980, 1984). Early research examined optimistic bias in relation to health threats unrelated to HIV and found that generally people believe they are less vulnerable than average to a wide range of health threats (Weinstein, 1980, 1984, 1987). In his research Weinstein (1989) found that in general, optimism was greatest for hazards that participants had little personal experience, for hazards rated low in probability, and for hazards judged to be controllable by personal action. Furthermore, Weinstein (1980) found that when people perceive they are in control of their personal actions, they tend to deny that these actions could be responsible for any undesirable outcomes.

Optimistic biases have been demonstrated in a wide variety of domains, however relatively few studies have investigated biased risk assessments in relation to STI/HIV. Since distorted risk perceptions may well lead to misguided decision-making and seriously impede risk reduction strategies, the existence of optimistic bias in the STI/HIV domain requires more

investigation. Of those studies investigating optimistic bias in relation to STI/HIV, several have concluded that cognitive factors such as perceived control, psychological denial, and the existence of an extreme prototype of those at risk (implied personality theories or beliefs about stereotypes), are key factors influencing unrealistic optimism in this domain (Bauman & Siegel, 1987; van der Pligt, Otten, Richard, and van der Velde, 1993; van der Velde, Hooykaas, & van der Pligt, 1992).

Factors Influencing Perceived STI/HIV Risk of a Specific Partner

In the context of the sexual transmission of STI/HIV, risk of infection is dependent on the infection status of the partner. The perceived STI/HIV risk or safety of the sexual partner may be an important factor influencing STI/HIV risk perception that has been much overlooked in past research. Some studies have shown that individuals engage in unprotected sex with partners who they believe are safe (Clark et al., 1996; Gerrard, Gibbons, Warner & Smith, 1993; Hoffman & Cohen, 1999; Maticka-Tyndale, 1991). Further evidence suggests that when perceptions of a specific partner's STI/HIV risk are lowered or the partner is perceived as safe, the motivation to engage in safer sexual behaviour with that partner is lowered (Skidmore & Hayter, 2000; Swann et al, 1995; Williams et al., 1992). Little work has been directed at identifying whether people are using partner safety beliefs as a method for selecting safe partners. Risk perception that may be influenced by a specific partner (PSRP) is a concept requiring further investigation as both overall STI/HIV risk perception and the motivation to engage in self-protective behaviour with a specific sexual partner may be impacted.

Stereotypical Judgment or Implicit Personality Theories

When considering STI/HIV risk perception in relation to a specific partner, van der Pligt and colleagues (1993) state that people often have an image of those likely to suffer from an STI or HIV. These images are generally related to stereotypical judgment often resulting in an

optimistic bias which may induce people into thinking they are capable of recognizing someone with an STI/HIV (van der Pligt et al., 1993). Weinstein (1980) found that stereotypical judgment was a significant predictor of optimistic bias when assessing the perceived likelihood of a negative health outcome. People produce optimistic or illusory beliefs regarding negative health outcomes because they tend to compare themselves with an incorrect norm (Weinstein, 1989). Weinstein's findings showed that when individuals judged themselves to be in control of an event due to their own personal actions, they often had a stereotypical image in mind of the kind of person who would be unable to control the event and to whom the event would generally occur. A comparison group with an unrealistically high risk was created and an extreme image of the person associated with the risk group was formed (Weinstein, 1980, 1984). Because this image did not fit with the individuals own self-image, they did not perceive themselves to be a member of this group. Individuals viewing themselves as deviating significantly from the stereotype may manifest unrealistic optimism in assessing their own risk (Bauman and Siegel, 1987).

Weinstein's findings are applicable in the domain of STI/HIV as evidence indicates that people not only believe they have control over avoiding HIV but also hold stereotypical beliefs about the type of person who is infected with HIV. If the image of a sexual partner is not consistent with the image of someone who is infected with an STI or HIV, the possibility that the partner could be infected may be discounted. van der Pligt et al. (1993) derived risk profiles for a variety of health risks and found participants' rated STI/HIV risk as 'highly controllable and clearly associated with specific groups. Similarly, Brown (1998) found global denial of HIV risk among a sample of college students who viewed their risk of HIV infection by framing vulnerability in terms of risk group membership rather than personal risky sexual behaviour.

In much of the STI/HIV literature, stereotypical beliefs in relation to STI/HIV are referred to as implicit personality theories. Although these concepts are similar, the psychological literature differentiates them by asserting that stereotypical beliefs are a set of qualities or attributes that are associated with particular groups or categories of people whereas implicit personality theories are the perceived relationships among these attributes (Schneider, 2004). Schneider (2004) argues that stereotypes must be examined using an implicit personality theories framework because people readily infer that certain traits “go together.” For example, hostile people are unhappy people, and short people are insecure.

Implicit personality theories is a construct often operationalized in the STI/HIV literature as a set of assumptions or beliefs held by an individual about the characteristics of a person infected with an STI/HIV (Clark et al., 1996; Fisher & Fisher, 1997; Gold & Skinner, 1996; Gold et al., 1999; Offir et al., 1993; Williams et al., 1992). Individuals perceive relationships among certain attributes associated with particular groups. For example, a person met in a bar is more likely to be infected with an STI/HIV, or a person appearing to be healthy could not be infected with an STI/HIV. These studies show that individuals are relying on implicit personality theories to evaluate a sexual partner’s risk of STI/HIV transmission. They believe that it is possible to evaluate the partner’s level of STI/HIV risk based on his or her visible or inferred personal characteristics (e.g. appearance, profession, education) or the type of relationship with that partner (e.g. casual, committed, short term, long term duration). In addition, research findings show that sexual partners who are seen in a positive light, particularly those partners possessing the qualities of a possible relationship partner, (e.g. attractive, behave normally, and who have positive personality characteristics), are unlikely to be considered a source of risk for STI/HIV infection (Fisher & Fisher, 1996; Hammer, Fisher, Fitzgerald & Fisher, 1996; Offir, Fisher, Williams & Fisher, 1993; Williams et al., 1992).

Perceived Partner Attributes

Physical Attractiveness

Gilbert (1989) has shown that people frequently make relatively instantaneous judgments about others based on superficial characteristics. Once formed, these initial judgments are not easily altered. Instantaneous judgments about a sexual partner's safety based on his/her physical appearance therefore can be extremely unreliable.

Research shows that most people hold stereotypical beliefs about those who are physically attractive and often beauty is erroneously linked with goodness (Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992). Physically attractive individuals are believed to possess positive personality qualities (with a number of desirable but less visible traits inferred) and are therefore judged more positively than physically unattractive individuals (Albright et al., 1988; Berscheid, 1985). Assessing STI/HIV status in this manner interferes with one's ability to respond rationally to risk relevant cues such as whether or not the partner has had unprotected sexual encounters (Agocha & Cooper, 1999). Physical attractiveness has also been shown to induce good mood (Kendrick, et al., 1993) which increases reliance on the use of stereotypes during impression formation and behavioural decision making (Gold, 2002; Park & Banaji, 2000). These findings have been supported in heterosexual and gay populations. Agocha and Cooper (1999) conducted a study to investigate the influence of an opposite sex target's sexual history and physical attractiveness on an individual's perceived riskiness, desire to engage in sexual intercourse with the target, and intention to use safer-sex behaviours (should intercourse occur) in a sample of 280 undergraduate psychology students. Findings from a logistic regression analysis indicated that although sexual history significantly and positively predicted the perceived riskiness of the target, it did not predict intentions to use condoms should sexual intercourse with the target occur. Physical attractiveness was found to negatively predict

perceived risk however it was not related to condom use intentions. A supplementary path analysis highlighted the influence of the desirability to have sexual intercourse with a physically attractive target as a proximal cause of lowered risk perceptions and decreased safer-sex intentions.

Similar results have been found through studies with gay men. These studies have also shown that physically attractive people are thought to be unlikely carriers of HIV even if little information about them is known (Offir, 1993). Gold, Skinner, Grant and Plummer (1991) reported findings that indicated that gay men used perceptible characteristics (the way one looks, speaks, or behaves) to infer the antibody status of their sexual partners when describing both an actual sexual encounter and when reading descriptors of people they had never met.

Qualitative studies have found that when judging the riskiness of a sexual partner, people relied on factors concerning the partner's overall appearance to determine safety. In a study investigating gay men's stereotypes, Gold, Skinner and Hinchy (1999) found that men wearing fashion label clothing were judged to be significantly less likely to be infected with HIV than men wearing leather, denim or dance party clothing. Similar results have been found in qualitative studies that have used different populations. For example, in focus group research with heterosexual college students ($n=308$), Williams et al. (1992) found that participants tended to assume that those who dressed provocatively or were met in bars were more likely to be risky people. Two other qualitative studies have reported similar results using STD clinic populations. Hoffman and Cohen (1999) conducted focus group sessions with 42 participants to examine determinants of partner assessments. Using naturalistic inquiry and grounded theory to analyze qualitative data, these authors found that participants used partner assessments based on appearance as a means of protection from disease. Partner assessments determined whether a potential partner was safe or looked "clean." For male participants, clean meant that the woman

looked good overall, seemed responsible and respectable, drove a nice car, and was “together.” For female participants, clean meant the partner had to look presentable. In addition, both male and female participants reported relying on the type of possessions, types of friends, and where the partner was from to evaluate safety. Questions about the number of partners, HIV status, or previous injection drug use were never asked. Findings from an ethnographic study conducted by McDonald, Thomas, and Eng (2001) support those of Hoffman and Cohen (1999). These authors conducted 38 ethnographic interviews to gain an understanding of how people at high risk for STI’s made decisions and took actions to protect themselves. Standard qualitative research methods were used to identify emic prevention strategies. An emic perspective considers an insider’s view or gives consideration to the way members of a culture view their world. The most common practice of primary prevention reported was partner selection based on appearance. Participants frequently referred to judging a potential partner’s appearance to determine if he or she was clean (disease free) or “dirty” (diseased).

Inaccurate STI/HIV Heuristics

Misovich, Fisher, and Fisher (1997) allege that a major barrier to HIV prevention involves people’s use of incorrect AIDS prevention heuristics. They define these as “simple decision rules that permit relatively automatic and cognitively effortless decisions about whether or not a partner is at risk for HIV and thus whether or not to practice safer sex with the partner” (p. 85). They argue that AIDS prevention heuristics have developed in accordance with general cultural values supporting sexual activity within committed relationships but not with relatively unknown partners. Other researchers (Clark et al., 1996; Kelly & Kalichman, 1995; Misovich et al., 1996; Williams et al., 1992; Woliski & Branson, 2002) agree and also suggest that the public health advice to “know your partner well or use condoms” may have led to higher levels of risky sexual behaviour between well-acquainted individuals whose HIV status is unknown. Two

common heuristics identified in the STI/HIV literature as inhibiting AIDS prevention in relationships are “known partners are safe partners” and “monogamous relationships are safe relationships” (Misovich et al., 1997).

Relationship Characteristics

Known partners are safe partners

The context of a relationship can influence HIV risk perceptions with the duration of the relationship often used as an index of trust and safety. Individuals are more likely to use condoms early in a relationship when a partner is not well known than when a relationship has progressed and familiarity with the partner has increased (Fortenberry et al., 2002; Maticka-Tyndale, 1991; Williams et al., 1992). Several studies have shown that condom use is more likely to occur with casual partners or new relationship partners than with committed or main sex partners (Ellen et al., 2002; Ellen, Cahn, Eyre, & Boyer, 1996; Fortenberry, Tu, Harezlak, Katz, & Orr, 2002; Gebhardt, Kuyper, & Greunsven, 2003; Reisen & Poppen, 1995). In a study investigating HIV prevention heuristics and condom use among African-Americans at risk for HIV, Thornburn, Harvey, and Ryan (2005) investigated whether the endorsement of the known partners are safe partners and trusted partners are safe partners heuristics were associated with condom use. In their study the authors recruited male and female participants ($n=80$) aged 18 to 25 years from community family planning and STD clinics. Beliefs endorsed by the largest percentage of participants were related to the known partners are safe partners (34%) and trusted partners are safe partners (17%) heuristics. Findings indicated that stronger endorsements of the known partners heuristic were associated with a lower percentage of protected acts of intercourse (vaginal and anal) in the past 90 days ($r = -0.27, p < 0.05, n = 78$), not having used a condom during last vaginal sex ($r_{pb} = -0.32, p < 0.01, n = 80$) and using condoms less often with vaginal sex ($r = -0.26, p < 0.05, n = 80$).

Other research findings have also indicated that individuals are using the known partners are safe partners heuristic to determine the sexual safety of their partner. For example, in a study examining situational factors associated with high risk sexual behaviour among young adults, Keller (1993) found that 50% of participants ($n=272$) reported that their reason for not using a condom during sexual intercourse was that they “just knew” their partner was safe. These findings are also supported in research conducted by Misovich et al. (1996) who investigated the extent to which sexually active college students ($n=325$) believed that “knowing their partner well” eliminated the need to practice safer sex. Students completed a self administered questionnaire assessing beliefs about knowing one’s partner, actual condom use, and the intention to use condoms. Findings showed that the endorsement of these beliefs was common and significantly and negatively correlated with levels of condom use and intentions to use condoms, especially among women. These authors concluded that many college students, most of whom have no objective information about their partners’ HIV status, believed that knowing their partner negated the use of safer sexual practices. Moreover, these authors stated that such beliefs were associated with higher levels of AIDS-risk behaviour. This conclusion is in agreement with Peterman et al.’s (2000) finding that people tended to have safe sex with partners perceived to be risky and risky sex with partners perceived to be safe. Similar results are also reported by Maticka-Tyndale (1991) who, in addition to concluding that people are choosing partners based on the known partners are safe partners heuristic, postulate that this belief is reinforced by the lack of personal experience or contact with infected others, and on the belief that STI/HIV infection can be avoided by using condoms only with partners considered to be risky.

Monogamous relationships are safe relationships

It is generally believed that those in a committed relationship are at a lower risk of contracting an STI or HIV than those not in a committed relationship. This idea therefore may have contributed to the belief that monogamy serves as a form of safer sex regardless of whether the partner's STI/HIV status is known. Monogamous behaviour was once promoted as an effective method to protect an individual from contracting an STI/HIV. However, monogamy characterized by one lifetime partner or a long-term monogamous relationship has become confused with other variations of monogamy present in society today. For many, monogamy means either serial or realistic monogamy. Serial monogamy refers to a series of brief sexually exclusive relationships whereas realistic monogamy refers to serial monogamy combined with occasional instances of sex with short-term sexual partners (Kelly & Kalichman, 1995; Misovich et al., 1997). Although it appears people feel safe in relationships and consider them to be exclusive and permanent while they are occurring, this does not protect against STI/HIV and may have contributed to a false sense of security among individuals in partnerships. Kraut-Becher and Aral (2003) used data from a national cross-sectional survey of 2768 women in the United States aged 15 to 44 years, and found that approximately 70% of the sample reported serial monogamous partnerships with more than one quarter reporting overlapping or concurrent partnerships.

Research reviewed by Kelly and Kalichman (1995) and research conducted by Misovich et al. (1997) and Hammer et al. (1996) indicates that many individuals believe monogamy is a safer sexual practice, despite the fact that no STI/HIV testing is conducted prior to initiating unprotected sexual activity. These authors asserted therefore that few people in close relationships can be certain that they are not at risk for transmitting or becoming infected with an STI or HIV. Findings from a study conducted by Comer and Nemeroff (2000) indicated that

females judged regular partnerships as safe regardless of whether they had any evidence to support their evaluations. Similarly, in a study of 411 urban female adolescents, Kershaw et al., (2003) investigated the relationship between perceived risk and sexual risk behaviour.

Participants were classified as accurate or inaccurate risk perceivers on the basis of actual sexual behaviour and perceived risk and then compared on psychological maintenance variables, risk knowledge, and relationship context variables (partnership duration and pressure to have unprotected sex). Multivariate linear regression results indicated that female adolescents used the context of their sexual relationships to assess risk. Those who engaged in unprotected sex reported that they felt they were at little risk for an STI/HIV if they were with a long-term partner. These same results were obtained even when participants were known to have additional risk factors such as a risky partner. This indicates that long-term relationships are equated with trust and safety even when the evidence does not support this assumption.

Trust. It has been suggested that relationship characteristics such as intimacy, trust, and presumed fidelity are factors influencing decreased condom use (Gebhardt et al., 2003). Several studies have shown that individuals switch from condom use in new relationships to oral contraception in more committed relationships as a way to symbolize the beginning of a trusting and committed relationship (Hammer et al., 1996; Maticka-Tyndale, 1991; Rosenthal, Gifford & Moore, 1998). In-depth interviews conducted by Skidmore and Hayter (2000) with 50 heterosexual young adults showed that the concepts of knowing and/or trusting were prominent factors with regard to longer term relationships. These authors found that conditions for unprotected sex differed for men and women. Women claimed that they needed to first establish trust whereas men claimed to need to know their partners. Misovich et al. (1997) state that once partners in a relationship begin to trust each other, they often decide it is safe to assume their partner has not engaged in behaviours that would result in HIV transmission.

Maintaining intimacy in a relationship is often a high priority for relationship partners (Clark et al., 1996; Williams et al., 1992). Tschann et al. (2002) suggest that if relationship partners are not equally emotionally involved, the partner having less desire for emotional intimacy will have greater control or intimacy power in the relationship because the more involved partner is willing to do more to maintain the relationship. Tschann et al. (2002) investigated the influence of emotional intimacy on condom use among 228 adolescent STD clinic clients and found that the adolescents who desired more emotional intimacy were the ones less likely to get their way about condom use. Gender differences indicated that young men perceived themselves to have more emotional intimacy power in relationships than young women. Gebhardt et al.'s (2003) findings also indicated that the meaning attached to sex (to express love) and the relationship in which sex occurs, are more predictive of unsafe sex with casual partners among female than male adolescents.

Familiarity. As an individual accumulates more information about a partner, feelings of familiarity increase resulting in the individual becoming less concerned about the risk of STI transmission (Fisher & Fisher, 1997; Swann et al., 1995). Familiarity therefore leads to judgments of lower HIV risk with condom use not likely perceived as necessary because the partner is no longer viewed as a threat for STI/HIV transmission (Kelly & Kalichman, 1995; Swann & Gill, 1997). Fortenberry et al. (2002) found that although condom use rates were higher in newer relationships among young adult STD clinic clients, by 21 days condom use had declined to levels similar to that of established relationships (43% and 41% respectively). New relationships therefore were considered to be established relationships within a 3 week time period. Several qualitative studies have used focus group methodology with college students to investigate the dynamics underlying risky sexual behaviour (Hammer et al., 1996; Skidmore & Hayter, 2000; Williams et al., 1992). Findings from these studies indicated that partners, whom

students perceived to be safe, were those people with whom the student was familiar. Students were found to have made safety evaluations based on familiarity even when the only known information about the partner was irrelevant to HIV status.

Although limited quantitative research has investigated the known partners are safe partners heuristic, findings from these investigations support those of qualitative studies. In a study examining situational factors associated with high risk sexual behaviour among young adults, Keller (1993) found that 50% of participants ($n=272$) reported that their reason for not using a condom during sexual intercourse was that they just knew their partner was safe. Maticka-Tyndale's (1991) findings support those of Keller (1993) and additionally indicated that this belief is reinforced by the lack of personal experience or contact with infected others, and the belief that STI/HIV infection can be avoided by using condoms only with partners considered to be risky. This is consistent with Weinstein's (1980, 1989) finding that optimism is often strongest for hazards which people have little personal experience and those rated low in probability. Misovich et al. (1996) investigated the extent to which sexually active college students ($n=325$) believed that knowing their partner eliminated the need to practice safer sex. In their study students completed a self administered questionnaire assessing beliefs about knowing one's partner and the relationship of this belief between actual condom use and the intention to use condoms. These findings showed that the endorsement of this belief was common and significantly and negatively correlated with the level of condom use and the intention to use condoms, especially among women.

Through focus group research with graduate students, Williams et al. (1992) found that students ($n=308$) had a well-developed and generally accepted set of ideas regarding which potential partners were risky for HIV infection and which were not. They consistently found that partners whom students knew, liked, trusted, and thought were similar to them were perceived

to be safe. The decision to not practice safer sex with these partners was based on the individual's reluctance to link risk or disease with loving or caring. As individuals are drawn to their partners by feelings of attraction and affection, it is these feelings that may interfere with rational risk assessments and result in the partner not being seen as a potential source of infection or disease (Kelly & Kalichman, 1995; Kirkman, Rosenthal & Smith, 1998; Williams et al., 1992). These findings are consistent with early research on interpersonal attraction which identified familiarity, similarity to oneself, and trust as predictors of attraction and intimacy (Berscheid, 1985). Other qualitative research (Skidmore & Hayter, 2000; Hammer et al., 1996) has produced similar results and in addition, associated familiarity and trust. Additionally, these findings indicate that there is another heuristic embedded within familiarity, namely that familiar partners are trusted partners and therefore trusted partners are safe partners. To test the assumption "what is familiar is safe," Swann et al. (1995) conducted a study with 157 college students to determine the impact of familiarity on perceptions of a risky target. ANOVA results revealed a significant effect in that increased familiarity with a target person (who actually was HIV positive) caused participants to lower their estimates of the target's riskiness despite the fact that they were explicitly warned that the target might be HIV positive. This implies that as one becomes more familiar they also become more confident of their impressions. However, are confident impressions necessarily accurate ones?

Accuracy of STI/HIV Heuristics

While most people believe they have considerable insight into their partner's character, and express confidence in the accuracy of their impressions, research findings indicate that an individual's perception of their partner's STI risk factors are often not in agreement with that partners' self-reported behaviours. In a study investigating how well people can discern their partners' risk behaviours, Stoner et al. (2003) conducted face to face interviews with 151

heterosexual STD clinic clients (aged 14 – 45 years) with chlamydial or gonorrheal infection and 189 of their sexual partners. Interviews with the STD clinic clients examined their perceptions of their sexual partners' sociodemographic characteristics and risk behaviours. These perceptions were then compared for agreement with the partner's self-reports. Findings from this study indicated that although participants had relatively high levels of agreement for certain partner and partnership characteristics (e.g. race, ethnicity, and age), they had relatively low levels of agreement for STI risk factors such as whether the partner had had other partners in the previous 3 months ($\kappa=.029$), the total number of partners in the previous 3 months ($p=0.23$), history of sex work among female partners ($\kappa=0.27$), and history of male partners having sex with sex workers ($\kappa=0.22$). These findings have been supported by Ellen, Vittinghof, Bolan, Boyer, and Padian (1998) using a similar population. In addition, Drumright, Gorbach, and Holmes (2004) found that the overall ability for individuals to predict whether their partners were having concurrent sexual partnerships was poor ($\kappa=0.17$). These authors defined concurrent sexual partnerships as those in which there is partner overlap (e.g. one or more of the members has other sexual partners with repeated sexual activity with the original partner). Multivariate models were used to determine associations between a partner's concurrency, knowledge of the partner's concurrency, and an individual's current STI status. Findings showed that partner concurrency and poor knowledge of a partner's concurrency were significantly associated with an individual's positive STI status after controlling for all potential risk factors and number of sexual partners in the preceding 12 months.

Although it appears that people develop a personal strategy for avoiding HIV infection, the success of these strategies is largely dependent on several factors. These include accurate knowledge of one's own HIV status, accurate knowledge of a partner's HIV status, the willingness of partners to disclose their HIV status, and an individual's willingness to select

partners based on HIV status. While many individuals may ask a partner about their sexual history, many do not specifically ask about HIV status. Wolitski and Branson (2002) suggest that the reluctance to be tested for HIV, the unwillingness to ask specifically about HIV status, and the failure to disclose this information act as barriers to the successful use of partner selection strategies. Varghese et al. (2001) developed a model to estimate the per-act relative and absolute risks of acquiring HIV infection during sexual contact on the basis of the choices of partner, sex act, and condom use. Their findings confirmed what seems to be intuitively obvious: choosing a partner who tests negative instead of an untested partner reduces the risk for HIV acquisition 47-fold, and using condoms reduced the risk 20-fold.

Other Influences on STI/HIV Risk Perception

Gender

Although STI's affect both men and women, women are at greater risk of contracting an STI for reasons associated with biology and gender. As a result, the number and percentage of women affected by STI's are increasing worldwide with women sharing a disproportionate burden of sequelae from STI's. According to UNAIDS (2004), since 1985 the percentage of women among adults living with HIV/AIDS has risen from 35% to 48% worldwide with young women currently accounting for over 60% of all 15 to 24 year olds living with HIV/AIDS. Recent Canadian estimates are similar and indicate that since 1996 there has been a 48% increase in women living with HIV. Annually, women account for a growing proportion of positive test results among adults in Canada (Health Canada, 2003b). Primary exposure categories for women are heterosexual contact and injection drug use which accounted for 95.1% of all newly diagnosed HIV infections among women in 2001. Heterosexual contact is now considered the main risk factor for HIV infection in women and accounted for 63% of newly diagnosed cases in adult women in 2001 (Health Canada, 2003b).

With heterosexual transmission representing a significant route of STI transmission for women, few behavioural models or prevention efforts to date have focused on the influence of gender on risk behaviour. Male and female sexual behaviour is influenced, and sometimes defined by the socialization of the different gender roles (Amaro, 1995). Traditional gender stereotypes suggest that women and men have been socialized to view sex differently. For women, sex is viewed as something that should occur in the context of a relationship with an emphasis on love, intimacy, and commitment. Men however have been socialized to view a willing partner as sufficient justification for having sex with an emphasis on physical pleasure and sexual prowess (Carrol, Volk, & Hyde, 1984). In a qualitative study exploring sexual behaviours and beliefs among 112 sexually active heterosexual adults, Rosenthal, Gifford, and Moore (1998) found that women tend to construct sex in terms of love and romance whereas men tend to construct sex as a hunt or ego boost separate from the context of romance and love.

For women, identity is strongly related to connection, caring, and relationship with others. According to Amaro (1995) women will take great personal risks, including those related to sexual risk, to maintain their relationships. In a study examining women's perceptions of their partner's HIV risk in the context of ongoing relationships with a sexually risky partner, Clark et al. (1996) found that women who were more emotionally attached to a nonmonogamous partner were more likely to report lower perceived STI/HIV risk of their partner and lower condom usage than those women who were not as emotionally attached. For women, the existing power differential between men and women also influences sexual behaviour as men often have more control over condom use than women. Research shows that women are uncomfortable about insisting on condom use for fear of the reactions of their male partners regarding trust and commitment issues (Health Canada, 2003b).

Research findings suggest that men are more likely to engage in sexual risk taking behaviour than women (Health Canada, 2003b). Jadack, Hyde, and Keller (1995) conducted a study to explore gender differences in knowledge, attitudes, and behaviours related to the spread of HIV among 197 male and female college students who were sexually active. Findings indicated that men engaged in significantly more risky behaviours than women and reported that intercourse occurred in unplanned spontaneous situations while under the influence of alcohol or drugs, or with a person not well known. In contrast, women reported that intercourse without a condom occurred in long-term sexual relationships and that they were significantly more comfortable abstaining from sexual intercourse and asking a partner about their sexual history.

Alcohol

One interpretation of the relationship between alcohol use and high-risk sexual behaviour concerns the fact that alcohol may act as a sexual disinhibitor. As such, individuals consuming alcohol are viewed as being at greater risk of becoming infected with an STI/HIV through unsafe sexual practices. Substance abuse is often associated with sexual risk behaviour as evidence indicates it lowers inhibitory control thereby resulting in impaired decision-making (Fillmore & Vogel-Sprott, 1999). Results from two alcohol administration studies conducted by Fromme, Katz, and D'Amico (1997) showed that alcohol intoxication may contribute to risk-taking behaviour by an effect on cognitive processing. Specifically, these authors found that when an intoxicated person's expectation about a potential negative consequence is altered, that person is more likely to engage in risky behaviour. Further research by these authors (Fromme, D'Amico, & Katz, 1999) indicated that alcohol intoxication may contribute to sexual risk taking by reducing perceptions of personal risk. Multivariate results indicated a significant effect of beverage (alcohol, placebo, no alcohol) for rating of sexual activities (sex expectancy: high, low) with a new partner. Planned contrast analysis indicated that participants who received

alcohol provided lower ratings of risk and indicated that negative consequences were less likely to influence their decision to engage in sexual activities with a new partner, than those who received placebo or no alcohol.

Furthermore, findings from other studies have shown that alcohol use in sexual contexts is associated with engagement in high risk behaviour. Findings from Simbayi et al.'s (2004) study showed that individuals with higher alcohol scores demonstrated lower rates of using risk reduction strategies. Logistic regression results showed that alcohol use was related to a greater numbers of sex partners and higher rates of unprotected vaginal intercourse. These authors also found that individuals who drank in sexual contexts reported greater prevalence of condom failure. Similarly, Buchanan, Poppen and Reisen (1996) reported similar findings among gay and bisexual men. Additionally, one of the most frequently mentioned reasons cited in qualitative studies for engaging in unsafe behaviour is alcohol impairment (Hammer et al., 1996; Williams et al, 1992).

Summary

Evidence presented shows that the incidence of STI's and HIV continue to rise in Canada. Health behaviour theories have failed to adequately explain STI/HIV risk perception and risk taking behaviour. Emerging research is now indicating that many individuals are choosing partners they believe are safe or uninfected with an STI/HIV. The information many use to evaluate sexual safety is based on inferred partner attributes and relationship characteristics. These subjective inferences are further biased by the underlying desire to perceive the sexual partner in a favourable light. Accurate assessments are not achieved as many of the relevant risk factors often remain concealed (e.g. STI/HIV status, sexual behaviour history).

Although the research findings discussed thus far support the perspectives presented in this thesis, some methodological points concerning the research cited must be considered. First,

issues concerning generalizability must be noted as the majority of the research cited has been conducted using convenience samples with college students who were compensated for their participation. College students represent a biased sample of the population because they tend to be healthier, better educated, and may have been exposed to less hazards/negative events than those in the general population. Therefore, the generalization of many of these findings to other populations is unknown. Second, most of the research has utilized a correlational design with its associated weakness for inferring causation. While STI/HIV research problems do not ethically lend themselves to an experimental design, further longitudinal studies would provide more support to causal links between variables. While some of the studies cited are strengthened by the fact that they employed multivariate analyses, there may still be other omitted variables. Third, the majority of research cited has relied on self-reports which are subject to recall and social desirability biases. Willingness to discuss and portray one's sexual behaviour accurately may present issues differing from other health behaviour research.

This literature review points to gaps in our knowledge regarding the influences of the context in which sex occurs. The factors influencing STI/HIV risk assessment and the effect this has on sexual behaviour need clarification. Additional research to illuminate the complexities inherent in sexual situations will contribute to more effective STI/HIV preventive strategies and reduce the health and economic burden of these infections.

CHAPTER 3: METHODS

The purpose of this study was to examine the degree to which relationship characteristics and sexual partner attributes influenced a heterosexual adult's perception of a sexual partner's STI/HIV risk and in addition, examine relationships among these factors and perceived STI/HIV risk, condom use, and demographic and background factors. In this chapter, I provide a description of the study design, sample, measurement, data collection, and data analysis methods. I also discuss how the ethical concerns of this study were addressed.

Research Design

This study used a cross-sectional, correlational survey design to collect data on factors influencing STI/HIV risk perception and risk behaviour among adult heterosexual men and women. As no single instrument was identified in the literature to address the purpose and needs of this study, a structured self-report questionnaire was developed. Following ethics approval, a pilot test was conducted with fifteen participants to determine participant burden and to evaluate and refine questions prior to beginning data collection. Pilot testing confirmed that the items contained in the questionnaire were easily understood and some minor changes were made to address any concerns that arose.

Sample

This study used systematic nonprobability sampling. Participants were recruited from the BC Centre for Disease Control's Sexually Transmitted Disease (STD) Clinic. As clients attending this clinic are seeking testing and/ or treatment for STI's, they represented a more at-risk population than the general population for testing risk perceptions and sexual behaviour.

All STD clinic clients were approached regarding their interest in participating in the study. The target population for the study was adult heterosexual STD clinic clients who met the following sample criteria and who consented to participate in the study: (1) a client of the STD

clinic, (2) adults 19 years of age and over, (3) those who self-identified as heterosexuals, (4) those who had only sexual partners of the opposite sex within the last six months, (5) those who had penetrative penile vaginal or penile rectal sex within the last six months, (6) those who believed they were HIV negative, and (7) those who were able to understand written and spoken English. Exclusion criteria were: (1) HIV positive clients. Clients were offered a \$10 honorarium for participating in the study to help defray costs associated with inconvenience and parking expenses. Participants had the opportunity to self-identify themselves as heterosexual by selecting the appropriate box on the inclusion criteria check list as well as selecting the appropriate box regarding sexual orientation when completing the questionnaire. As HIV is one of the most prominent STI's, and one considered to have the most severe consequences, HIV positive clients were excluded from this study as their perception of risk for HIV differs from those who do not have, or believe they do not have HIV.

A total of 668 STD clinic clients were provided with a letter of introduction (Appendix A) and an inclusion/exclusion criteria check list (Appendix B) between September 27, 2004 and January 10, 2005 resulting in 317 completed questionnaires. Of the 668 clinic clients, 430 (65%) met the eligibility criteria, 112 (17%) did not meet the criteria, and 126 (19%) stated they were not interested in participating however no eligibility was determined. Of the 430 eligible clients, 317 (74%) completed questionnaires, 96 (22%) were not interested, 8 (2%) were not provided with a questionnaire, and 9 (2%) did not return the questionnaire. Among those stating they were not interested in participating, the most commonly cited reason was due to lack of time for questionnaire completion. Four of the 317 questionnaires were discarded due to excessive amounts of missing data. Therefore a total of 313 participants completed questionnaires which were included in the statistical analyses conducted for this thesis.

Setting

The STD clinic that was used to collect data for this research study is a facility operated by the STD/AIDS Control division of the British Columbia Centre for Disease Control (BCCDC). The clinic is located within close proximity to the downtown sector and services are provided free of charge. The majority of clients attending the clinic live in the greater Vancouver area. The clinic is staffed by nurses and physicians who provide assessment, case management, and counselling for patients at risk for STI's and HIV. The approximate number of clients visiting the clinic each month is 1,000. This includes new clients as well as those returning for follow-up appointments.

Sample Size

The sample size needed for this study was estimated to be 160 participants. This sample size was calculated using a power analysis for multiple regression based on the following formula by Cohen (1987):

$$N = \frac{L(1 - R^2)}{R^2} + u + 1$$

where N = total sample size, L = effect size index, R^2 = effect size, and u = number of independent variables (as cited in Munro, 2001). According to Cohen, the effect size index, L , is defined as a function of power and the number of independent variables at a given level of alpha. In order to calculate the power analysis for this study, it was estimated that six independent variables would be used in the model. Therefore to obtain a power of 0.80 with an alpha of .05, six independent variables were used to obtain the L value (13.620 from the L value tables provided in Cohen, Cohen, West and Aiken, 2003). Cohen's (1987) convention for a moderate effect size ($R^2 = 0.13$) was also used (as cited in Munro, 2001). The following sample size was calculated as follows:

$$N = \frac{13.62 (1 - 0.13)}{0.13} + 6 + 1$$

$$N = 145$$

Fifteen more participants were added to account for missing or incomplete data.

Measurement

The study instrument incorporated emerging concepts in the literature related to an individual's perceived STI/HIV risk and/or safety. Instrument face validity was assessed by BC Centre for Disease Control STI experts, including the STD clinic nursing supervisor, STD/AIDS division nursing administrator, and nurses and physicians working in the STD clinic. Instrument validity therefore was based primarily on face and content validity. Given that the scales in the instrument were newly developed, factor analysis and internal consistency analysis was conducted to investigate the reliability and validity of the scale (see Factor Analysis section below). The operationalization of the relevant variables addressed in the study instrument follows.

Operationalization of Study Constructs

The questionnaire was comprised of 26 questions that incorporated, for the most part, self-report scales and items that were modified from scales and items used in previous STI/HIV research and that had reported satisfactory psychometric properties. The majority of items utilized closed-ended questioning with Likert and visual analogue scale responses. The final questionnaire, following pilot testing, is attached as Appendix C.

Partner STI/HIV Safety Beliefs

Partner safety was measured using two scales. A general partner safety scale (STI/HIV safety beliefs-general) measured perceptions of STI/HIV safety when considering sexual partners in general, and the specific partner safety scale (STI/HIV safety beliefs-specific) measured perceptions of STI/HIV partner safety in relation to a specific sexual partner. Both

partner safety scales consisted of 16 items (using a five-point Likert response scale) that were intended to capture the following seven factors related to relationship characteristics and partner attributes: Familiarity (items 1 – 4), Trust (items 5-6), Similarity (items 7-8), Likeability (item 9), Superficial Traits (items 10-13), Knowledge of Partner's Sexual History (items 14-15), Relationship Type (item 16). See Appendix C, questions 2 and 4.

The STI/HIV safety beliefs-general scale asked participants to rate their level of agreement with 16 statements in relation to their general views on how they evaluate partner safety. Participants read a statement that began with *"In general, I would be pretty sure that a person I was considering as a sex partner was safe (did not have an STI) if ..."* and then asked how much they agreed or disagreed with each of the statements. Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). See Appendix C, question 2.

The STI/HIV safety beliefs-specific scale asked participants to respond to a two-part question while considering a specific sexual partner that they believed created some risk for them (possible exposure to an STI). The same 16 statements were used for this scale with minimal wording changes to make each statement relevant to a specific partner. Participants were asked to read each statement and circle the verb phrase that applied to that specific partner. They were then asked to reread each statement and indicate the degree to which each statement influenced their beliefs about that partner's safety. Conducting this question as a two-part question allowed the participant to adapt each statement to their specific partner. Responses for each item ranged from 1 (*no influence*) to 5 (*strong influence*). See Appendix C, question 4.

Although questions two and four asked participants to rate each statement using a slightly different format (level of agreement versus level of influence respectively) both scales were intended to capture the participant's reliance on the perceived partner safety scale factors. For each scale, all 16 items were summed to obtain a total perceived partner safety scale score.

Higher total perceived partner safety scale scores indicated that an individual had greater reliance on relationship characteristics and personal attributes as a determinant of STI/HIV safety whereas lower scores indicated less reliance on these factors as a determinant of safety.

Perceived partner safety scale items were adapted from Clark et al.'s (1996) "Partner Safety Beliefs Scale" (consisting of personal characteristic and sexual network subscales) and Misovich, Fisher and Fisher's (1998) "A Measure of AIDS Prevention Information, Motivation, Behavioural Skills, and Behaviour Questionnaire." Clark et al. (1996) reported Cronbach alpha coefficients of .84 for males and .92 for females on their personal characteristics subscale (9 items) and .60 for males and .83 for females on the sexual network subscale (3 items). Seven (items 5, 6, 7, 8, 10, 12 and 13) of the nine items from Clark et al.'s (1996) personal characteristics subscale were used, and two (items 2 and 14) of the three items from the sexual network subscale were used to develop the perceived partner safety scales (PPSS) for this study's instrument.

A section of the Misovich, Fisher and Fisher (1998) questionnaire focused on AIDS prevention information measures. Nine of 46 items pertained to simple decision rules that individuals used to make rapid and possibly incorrect judgments about whether to practice safer sex. A Cronbach's alpha of .75 was reported for the overall prevention information section (46 items) however there was no information provided about the internal consistency for the set of items pertaining to simple decision rules. Three (items 1, 4 and 15) of the nine items pertaining to simple decision rules were adapted and used in the development of the PPSS. The remaining four items (items 3, 9, 11 and 16) were developed by the researcher based on literature readings (Hammer et al., 1996; Misovich, Fisher & Fisher, 1996; Offir et al., 1993; Skidmore & Hayter, 2000; Swann et al., 1995).

Perceived Specific Partner STI/HIV Risk

Question 3 (see Appendix C) asked participants to evaluate how likely it was, that a sexual partner they believed to have created some risk for them was infected with an STI/HIV at the time they had sex with that partner. Responses were measured on a 10cm visual analogue scale (VAS) anchored with 0% (*no chance*) and 100% (*very likely*). Participants were asked to mark a point on the line corresponding to the likelihood of their partner having an STI. This item was adapted from Clark et al. (1996).

Own Perceived STI Risk

Question 5 (see Appendix C) asked participants to evaluate the likelihood of contracting an STI/HIV from unprotected sex (e.g. not using a condom) in the future. Responses were measured using a 10 cm VAS anchored with 0% (*no chance*) to 100% (*very likely*). These items were derived from the concept of perceived susceptibility used in the Health Belief Model (Strecher & Rosenstock, 1997). This model suggests that behavioural anchors be used to assess susceptibility (e.g. If you do not practice safer sex, how likely are you to become infected with the AIDS virus?). Participants were also asked one opened-ended question regarding the type of STI's that concerned them the most (question 6).

Condom Use

Frequency of condom use was measured in general and specific terms. For general condom use participants were asked to estimate how often in the last six months they used a condom for STI prevention. General condom use was measured using a 10cm VAS with anchors of 0% (*never*) to 100% (*always*). See Appendix C, question 7. For participants who did not always use a condom for STI prevention in the last six months, question 8 measured how often factors such as alcohol, drugs, heat of the moment, no condom available, and partner did not want to use a

condom, affected their decision to not use condoms. Responses for each factor ranged from 1 (*never*) to 5 (*always*).

For specific condom use, a categorical “yes” or “no” answer measured whether participants used a condom for STI prevention the first time they had sex with a partner they believed may have created some risk for them (question 9). Participants not using a condom with this partner were then asked how much influence the above mentioned factors (alcohol, drugs, heat of the moment, no condom available, partner did not want to use a condom), had on their decision to not use a condom. Responses for each factor ranged from 1 (*no influence*) to 5 (*strong influence*).

Those in an ongoing sexual relationship with the partner identified in question 9 were asked to answer two more questions addressing condom use specific to that partner. One question (question 10) addressed condom use for STI prevention the last time they had sex with that partner, and one question (question 11) used a 10cm VAS with anchors of 0% (*no condoms*) to 100% (*always*) to measure average condom use with that partner. Consistent condom use was measured by including only those who answered both “yes” to using a condom the first time they had sex with their partner, and “yes” to the last time they had sex with their partner. Those participants not in a relationship had a “does not apply” option for questions 10 and 11.

Items assessing condom use were adapted from Clark et al. (1996), Misovich, Fisher and Fisher (1998), and Thato, Charron-Prochownik, Dorn, Albrecht and Stone (2003). Clark et al. (1996) assessed condom use with two items that asked participants to rank condom use (*never to always*) in the last 6 months and lifetime. Misovich et al. (1998) used three items and asked participants to rate the frequency of condom use in terms of a percentage and in terms of a ranking (*never to always*). Misovich et al.’s reported Cronbach’s alpha for these items was .98. Thato et al. (2003) used two items to assess condom use. One item addressed condom use at the

beginning of a relationship and one item addressed condom use for the last few sexual encounters. Both items rated condom use using a 5-point Likert response ranging from 1 (*never*) to 5 (*every time*). As none of these condom use measures specified the primary reason for using condoms, and many individuals do not use condoms for STI prevention but rather for birth control, condom use items in this study specified that condom use was for STI prevention.

Relationship Status

One question (question 21) asked participants about their relationship status with six categorical options provided. Participants were asked to choose the option that best described their relationship. Options were categorized into uncommitted and committed relationships with variations on the number of sexual partners within the relationship. This question was developed by the investigator and based on STI/HIV clinical experience.

Demographic Factors

One item addressed each demographic characteristic of age, gender, marital status, education, and household income. Demographic questions were adapted from the format used in the National Population Health Survey (Statistics Canada, 1997), the “Sex Now by the Numbers” survey (Trussler, Marchand & Barker, 2003) and the “HIV Positive Women Reproductive Health Choices Confidential Survey” (Ogilvie, 2003). Age was measured in years (question 12) with gender (question 13) and marital status (question 14) measured categorically. Income (question 15) and education (question 16) were measured as categorical level data.

Background Factors

Background factors for this study included alcohol and drug use and sexual history. These factors were used to describe the study’s population. One item (question 17) measured the frequency of alcohol intoxication and one item (question 18) measured the frequency of drug

highs. Questions addressing alcohol and drug use followed the format used in the “HIV Positive Women Reproductive Health Choices Confidential Survey” (Ogilvie, 2003).

Seven items addressed sexual history in terms of sexual orientation (question 19), current relationship status (question 20), age at sexual initiation (question 21), number of different lifetime sexual partners (question 22), number of different sexual partners in the last six months (question 23), and previous STI's (question 24). The item addressing sexual orientation was added as an additional inclusion criteria screening measure to provide participants with an opportunity to self-identify their sexual orientation. Questions were measured categorically and adapted from the National Population Health Survey format. Participants indicating that they have herpes, or have/ had genital warts were asked to also indicate how often they used a condom to protect their sexual partner. This was measured using a 10cm VAS scale with the anchors 0% (*never*) to 100% (*always*).

Factor Analysis Findings for STI/HIV Safety Beliefs-General and Specific

A factor analysis is often used to assist researchers in the instrument development process by organizing items into factors or groups of items that may be said to belong together. This assists the researcher in determining how items should be grouped together into subscales and determines which items should be dropped from an instrument entirely. Munro (2001) states this method helps to provide justification for the use of summated scales. As the STI/HIV safety beliefs scales used in this study were newly developed, a factor analysis was conducted to assist in organizing partner safety scale items into factors. In addition, a Crohnbach's alpha coefficient for the total scale was computed as a measure of internal consistency. The assumptions that apply to bivariate correlations also apply to factor analysis and these were evaluated prior to conducting the factor analysis (see Data Analysis section below).

Exploratory factor analysis using principal component extraction was used to examine the hypothesized scale structure for both the STI/HIV safety beliefs-general scale and STI/HIV safety beliefs-specific scale and to determine which items from these scales were the best indicators of perceived partner safety in general and in relation to a specific partner. For each scale, the 16 statement items were factor analyzed with one factor forced. The results for the STI/HIV safety beliefs-general scale are presented in Table 3 and results for the STI/HIV safety beliefs-specific scale are presented in Table 4. For the STI/HIV safety beliefs-general scale, the factor eigenvalue was 7.35. All items had factor loadings of 0.513 or higher, accounting for 46% of the variance. Following consideration of the results of the factor analysis, all items were retained as indicators of STI/HIV safety beliefs-general. This scale showed high internal consistency with a Cronbach's alpha coefficient of 0.92. For the STI/HIV safety beliefs-specific scale, the factor eigenvalue was 5.1. All items had factor loadings of .44 or higher, accounting for 35% of the variance. All items were retained as indicators of STI/HIV safety beliefs-specific. This scale also showed high internal consistency with a Cronbach's alpha coefficient of 0.87.

Table 1**Factor Loadings for STI/HIV Safety Beliefs-General**

Items	STI/HIV Safety Beliefs-General Scale Statement Items	Factor Loadings
6.	I felt this person was a "good" person	0.79
9.	I liked or loved this person very much	0.71
11.	This person seemed intelligent/well-educated/responsible	0.71
8.	This person had the same interests and values as me	0.71
12.	This person looked healthy/clean	0.70
1.	I felt I knew this person	0.70
16.	This person was someone I considered myself serious about	0.70
13.	This person seemed like they had slept around a lot	0.70
3.	I knew this person's friends	0.69
5.	I felt I could trust this person	0.69
4.	I knew about this person's lifestyle	0.69
7.	This person came from a background similar to mine	0.69
2.	This person was part of my close circle of friends	0.63
10.	This person was physically attractive	0.62
15.	This person said they thought they were safe	0.54
14.	I felt I knew this person's sexual history	0.51

Table 2**Factor Loadings for STI/HIV Safety Beliefs-Specific^a**

Items	STI/HIV Safety Beliefs-Specific Scale Statement Items	Factor Loadings
6.	I felt this person (was/was not) a "good" person	0.68
8.	This person (had/did not have) the same interests and values as me	0.66
5.	I felt I (could trust/could not trust) this person	0.62
2.	This person (was/was not) part of my close circle of friends	0.62
11.	This person (seemed/did not seem) intelligent/well-educated/responsible	0.62
1.	I felt I (knew/did not know) this person	0.61
16.	This person (was/was not) someone I considered myself serious about	0.61
12.	This person (looked/did not look) healthy/clean	0.60
13.	This person (seemed/did not seem) like they had slept around a lot	0.59
9.	I (liked or loved/did not like or love) this person very much	0.59
4.	I (knew/did not know) about this person's lifestyle	0.58
7.	This person (came/did not come) from a background similar to mine	0.57
3.	I (knew/did not know) this person's friends	0.57
10.	This person (was/was not) physically attractive	0.51
14.	I felt I (knew/did not know) this person's sexual history	0.51
15.	This person (said/did not say) they thought they were "safe"	0.44

^a For STI/HIV safety beliefs-specific statement items, participants circled one of two verb phrases (e.g. knew / did not know) that made the statement relevant to their specific partner.

Data Collection

Prior to data collection, the investigator conducted an in-service for all clinic staff regarding the nature of the research. Staff responsible for the recruitment of participants were provided with detailed information regarding the questions contained in the questionnaire and the requirements for its completion. This ensured that each staff member was able to provide appropriate information to participants regarding the research, answer questions arising from participants, and be aware of the importance of quality data collection. When clients arrived to the clinic, receptionists handed out a letter of invitation and an inclusion/exclusion criteria checklist. The inclusion/exclusion checklist included a "yes" or "no" answer question to determine if clients were interested in participating in the study. Clinic nurses or physicians referred to the inclusion/exclusion checklist to determine client eligibility once clients were brought to the examining room. Those eligible and interested in participating were provided with any additional information they requested about the study and had their concerns addressed. The questionnaire was given to the participant to complete during their clinic visit. Questionnaires were completed in private and placed in a sealed envelope which was then exchanged at reception for an honorarium. Completed questionnaires were kept in a locked filing cabinet in the nursing station and collected by the investigator regularly. All questionnaires were then kept in a locked office filing cabinet in the investigator's office. Receptionists were accountable for the honoraria and a log book with corresponding study numbers and honoraria dispensed. Honoraria were kept in a locked cash box in a locked filing cabinet in the nursing station.

Data Analysis

The investigator analyzed the data using Statistical Software for the Social Sciences (SPSS) Graduate Pack 12.0 for Windows. Raw data was entered twice to detect and eliminate data entry errors. Prior to analysis, the investigator screened the data for coding and data entry errors.

Missing Data

Missing data can be handled in several ways depending on whether the patterns of missing data are random or systematic (Munro, 2001). A random pattern consists of values missing throughout the data set in an unplanned manner whereas a systematic pattern consists of values missing in a methodological, non-random manner. In this study, missing data was assessed with both random and systematic patterns noted.

Small amounts of random missing data were found amongst the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific scale items (e.g. one or two statement items missing of 16). According to Munro (2001), when data values are missing in this fashion, estimation of missing values may be undertaken through imputation. This involves calculating mean values from available data on a variable to replace the missing values. Prior to imputing missing values on both STI/HIV safety beliefs scales, a student's *t* test was conducted to check for gender differences on scale scores. As no significant differences were found, missing values for the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific scale items were imputed using item means. Cases with larger amounts of missing data on statement items (e.g. one questionnaire was missing data on 7 of the 16 STI/HIV safety beliefs-general scale items and 6 questionnaires were missing data on all 16 STI/HIV safety beliefs-specific scale items) were deleted from total scale scores.

Pair-wise deletion was used for correlational analyses. This method excludes cases only if the variables being used in the analysis have missing data. List-wise deletion was used for all

other statistical analyses such as regression. The list-wise deletion method excludes cases from the analyses when there are missing values for any of the variables included in regression. As missing data for each statistical test was less than 10%, only the total number of respondents is provided in the tables presented.

Systematic patterns of missing data were noted on nine questionnaires. After examining the questionnaires, it was noted that data was missing for all items (background items) contained on pages 10 and 11 (questions 18 to 24). As these two pages were missed entirely on these questionnaires, it seems reasonable to assume that pages 10 and 11 may have been secured together causing participants to inadvertently miss these pages as they turned from page 9 to page 12 (which was the last page of the questionnaire).

Descriptive and Inferential Statistics

Both descriptive and inferential statistics were used to analyze the data for this study with specific analytic procedures selected according to each variable's level of measurement. Descriptive statistics were used to describe the sample population with frequencies and percentages calculated for variables measured on a nominal scale (e.g., education and income) and the mean, range and standard deviation calculated for those measured on a ratio scale (e.g. age).

Inferential statistics for this study included both bivariate and multivariate statistical procedures. Prior to conducting inferential statistical procedures, data was analyzed to ensure the underlying basic assumptions of each statistical test were met. Bivariate procedures included correlational analysis and independent *t* tests. Multivariate procedures included multiple linear regression.

For correlational procedures, Pearson's product-moment (Pearson's *r*) was used for relationships between two interval or ratio level variables (e.g. age and number of sexual

partners in the last 6 months). Alternative correlational procedures such as point-biserial was considered for relationships between a dichotomous variable (e.g. gender) and an interval or ratio level variable (e.g. STI/HIV safety beliefs scale scores) although Munro (2001) states this measure will give the same result as Pearson's product-moment. Prior to significance testing on correlation coefficients, the assumptions of normality, linearity and homoscedasticity were investigated by using box plot and scatter plot diagrams.

A *t* test was used for relationships between nominal level variables (e.g. gender) and interval or ratio level data (e.g. STI/HIV safety beliefs scale scores). Assumptions considered for *t* tests include a dependent variable that is continuous and normally distributed groups that are mutually exclusive with homogeneity of variance. Data was visualized using box plot diagrams for normality. An equality of variances test was used to test the assumption of homogeneity of variance.

Although Likert responses are technically ordinal in nature, in this study STI/HIV safety beliefs scale scores and mean factor scores determined from each Likert item were treated as interval level data to allow for more sophisticated statistical analyses. In reviews by Zumbo and Zimmerman (1991) and Rasmussen (1989), it was concluded that parametric statistical tests do not need to be replaced by nonparametric methods when the scale of measurement is ordinal rather than interval level. Furthermore, Zumbo and Zimmerman (1991) state that the shape of the distribution is a better criterion on which to base decisions about the use of parametric or nonparametric methods, than the variable's level of measurement. Rasmussen (1989) also stated that Type I and Type II error rates are not seriously compromised by the use of ordinal-level data in parametric tests and that previous studies have indicated results from a five-point scale do not differ much from that of a continuous parent population.

Multivariate statistical procedures used in this study included multiple linear regression. According to Cohen et al. (2003), multiple regression analysis can be used whenever a quantitative variable (the dependent variable) is to be studied as a function of, or in relationship to, any factors of interest (the independent variables). As a rule, dependent variables are usually measured on an interval or ratio level scale with independent variables measured on nominal, ordinal, interval or ratio level (Cohen et al., 2003; Munro 2001). Dependent variables (e.g. STI/HIV safety beliefs-general, STI/HIV safety beliefs-specific scores) for the multiple regression analysis in this study were measured on a ratio scale with independent variables measured on ratio (age), nominal (gender, marital status) and interval (education and income) level scales.

The data used in the multiple regression analysis were assessed for violations of the main multiple regression assumptions (linearity, independence, normality, equality of variance and collinearity). Linearity was investigated using scatter plot diagrams to explore the relationships between each independent (explanatory) variable and the dependent (response) variable. Independence was evaluated by using scatterplot diagrams to look for naturally occurring clusters or connected data points between each of the independent variables and the dependent variable. Normality was assessed using a histogram and boxplot of the standardized residuals. The boxplot assisted in identifying outliers, and lever values were used to identify influential data points. Equality of variance was determined by using a scatterplot diagram to plot the standardized residuals against each independent variable looking for a fan or curved shape. In addition, the variable inflation factor (VIF) was used as a diagnostic method for examining collinearity for each independent variable in the model. Although Cohen (2003) states that when statistics are used inferentially, the addition of certain assumptions about the characteristics of

the population substantially increases the useful inferences that can be drawn, he also states that multiple regression statistics are robust to moderate violations of these assumptions.

An ANOVA was done to test the overall fit or significance of the model. Although parametric methods were chosen to allow for more sophisticated statistical analysis, non-parametric methods were considered if the parametric assumptions had been violated.

Ethical Considerations

Permission to conduct this study was sought through the University of British Columbia (UBC) Behavioural Research Ethics Board and the BCCDC STD/AIDS division research committee. In addition, verbal approval was obtained from the STD/AIDS control nurse administrator and clinic nurse supervisor. As data collection for this study was limited to a written questionnaire that was completed by the participant, a covering letter was used in lieu of a consent form as specified by the UBC Behavioural Research Ethics Board. The letter provided the same information as a consent form and included a sentence that stated if the questionnaire was completed; it was assumed consent had been given.

CHAPTER 4: RESULTS AND ANALYSIS

In this chapter, the results and analysis of the study are presented. First, the sample characteristics are described. Second, descriptive statistics are provided in relation to study variables with gender differences. Third, relationships between main study variables and demographic and background factor variables are identified. Fourth, results are reported in relation to each research question.

Sample Characteristics

The 313 respondents ranged in age from 18 to 66 years ($M = 31.0$; $SD = 9.23$) with males accounting for 62% and females for 38% of the sample. The sample characteristics are summarized in Table 3. Seventy-six percent of participants described themselves as single at the time of their participation in the study versus 12% who were in common-law relationships or married, and 12% who were separated or divorced. Completed levels of education ranged from less than high school graduation to an earned doctorate. Only 5% indicated that they had less than a high school education, 54% reported they had some trade school or college/university or had completed trade school, and 41% reported a college or university degree. Total household income within the past 12 months ranged from less than \$10,000 to \$80,000 or more; the median income range reported was between \$30,000 and \$50,000. The majority of respondents (85%) listed their ethnic/cultural background as "White/Caucasian."

Background factors related to substance abuse, sexual history, and relationship status were used to describe sample characteristics associated with STI/HIV risk. Measures of substance abuse included the frequency of alcohol intoxication and drug highs within the last six months. Participants' reports about frequencies of alcohol intoxication and drug highs were classified into high (intoxicated several times a week to everyday) and low (never intoxicated to once or twice a month) categories. Forty-two percent reported a high frequency of alcohol intoxication

and 32% reported a high frequency of drug highs in the previous six months. Sexual history included age at first sexual intercourse, number of lifetime sexual partners, number of sexual partners within the last six months, history of previous STI's, and level of condom use within the last 6 months. The reported mean age of first sexual intercourse was 16 years ($SD = 2.96$). Participants reported a mean of 32 ($SD = 30$) lifetime sexual partners and a mean of 3 ($SD = 3.48$) sexual partners within the last six months. Almost half the sample (45%) reported a previous STI. The mean reported condom usage by participants in the previous 6 months for all sexual encounters was 56% ($SD = 31.00$).

Relationship status was categorized into those reporting they were in an uncommitted or committed relationship. Over half (53%) of the participants reported they were in uncommitted relationships. Fifty participants did not specify any relationship status and were therefore not included in this analysis.

Table 3

Sample Characteristics

Characteristics	Mean (SD)	Frequency (%)
Demographic Characteristics		
Age	31.00 (9.23)	
Gender		
Male		192 (61.70)
Female		119 (38.30)
Cultural Background		
White/Caucasian		261 (84.70)
Other		47 (15.30)
Marital Status		
Single		235 (75.60)
Common Law (CL) or Married		37 (11.90)
Separated or Divorced		39 (12.50)

Educational Level

<High school (HS) graduation	15 (4.80)
HS graduate	37 (11.90)
Some trade school	11 (3.50)
Completed trade school	22 (7.10)
Some college/university	99 (31.80)
Completed college/university	120 (38.60)
Post Graduate degree	7 (2.30)

Household Income

Under \$9,999	50 (16.20)
\$10,000 - \$29,999	103 (33.30)
\$30,000 - \$49,999	66 (21.40)
\$50,000 - \$79,999	57 (18.40)
\$80,000 or more	33 (10.70)

Background Factors**Alcohol Intoxication**

High	126 (41.70)
Low	176 (58.30)

Drug Highs

High	96 (31.80)
Low	206 (68.20)

Previous STI

No	160 (53.30)
Yes	140 (46.70)

Age of First Sexual Intercourse

16.62 (3.00)

Lifetime Sexual Partners

31.70 (30.24)

Sexual Partners Last 6 Months

3.30 (3.50)

General Condom Use

55.61 (31.00)

Relationship Status

Uncommitted	139 (52.90)
Committed	124 (47.10)

Note. N = 313. Missing data ranged from 11 to 13.

Main Study Variables

Univariate statistics and intercorrelations were computed for the main study variables. Table 4 presents means and standard deviations for ratio scale variables as well as percentages for categorical variables. Participants were asked to rate the likelihood that their sexual partner had an STI/HIV on a scale ranging from 0 (*no chance*) to 100 (*very likely*). The mean score for perceived STI/HIV risk of a specific partner was low at 34.11 (SD=27.39). Seventy-nine percent of participants rated their partner's chances of being infected with an STI/HIV as less than 50%. STI/HIV safety beliefs-general scale scores and STI/HIV safety beliefs-specific scale scores had possible ranges from 16 to 80 with higher scores representing a higher level of endorsement of STI/HIV safety beliefs. The mean score for the STI/HIV safety beliefs-general scale was 50.80 (SD 13.00). The mean score for STI/HIV safety beliefs-specific scale did not differ significantly at 51.50 (SD = 11.50). For own perceived STI/HIV risk, participants were asked to rate how likely it was that they would contract an STI/HIV within the next year if they did not use a condom on a scale ranging from 0 (*no chance*) to 100 (*very likely*). The mean score for own perceived STI/HIV risk was 48.80 (SD=32.17). Sixty percent of participants rated themselves as having a 50% (M = 48.80, SD = 32.17) or less chance of contracting an STI/HIV within the next year if they did not use a condom. More than half the sample (60%) reported using a condom the first time they had sexual intercourse with their partner.

Gender differences for the main study variables are also presented with significance levels identified. T-tests and chi-square statistics were used to identify statistically significant differences by gender. As illustrated in Table 4, for ratio scale variables, females reported statistically higher levels of perceived STI/HIV risk of a specific partner and own perceived STI/HIV risk compared with males, whereas males reported a higher number of lifetime sexual partners and number of sexual partners in the last 6 months.

Number of lifetime sexual partners and the number of sexual partners in the last six months were recoded as ratio scale variables with category midpoint values used for all subjects. For categorical variables, significantly more females (67%) than males (55%) reported using condoms during their first sexual encounter. Similarly, significantly more females (78%) reported earning less than \$49,000 annually than men (67%). Number of drug highs in the last six months also showed significant gender differences with significantly more men (40%) than women (18%) reporting a high frequency of drug highs in the last six months.

Table 5 presents the correlation coefficients for the main study variables.

Table 4**Main Study Variable Descriptive Findings**

Variable	%	Sample Mean (SD)	Male Means (SD) and %	Female Means (SD) and %	<i>t</i>	χ^2
Perceived Risk of a Specific Partner ^a		34.11 (27.39)	33.28 (27.01)	35.13 (27.72)	2.02*	
Endorsement of STI/HIV Safety Beliefs-General		50.80 (13.00)	51.70 (13.02)	49.28 (12.94)	1.60	
Endorsement of STI/HIV Safety Beliefs-Specific		51.50 (11.50)	51.43 (11.30)	51.49 (11.75)	-0.04	
Own Perceived Risk		48.80 (32.17)	45.40 (31.10)	54.47 (33.34)	-2.42*	
General Condom Use		55.61 (31.00)	55.53 (35.25)	55.00 (36.30)	0.13	
1 st Time Condom Use ^b						4.13*
Yes	59.90		55.30	66.90		
No	40.10		44.70	33.10		
Age		31.00 (9.23)	31.57 (9.3)	30.08 (9.07)	-1.39	
Cultural ^c						
White	84.70		87.30	80.70		2.48
Other	15.30		12.70	19.30		
Marital Status						
Single	75.60		75.00	76.50		2.25
CL/Married	11.90		14.00	8.40		
Sep/Divorced	12.50		11.00	15.10		

Income					
\$49,000 or <	70.90	66.50	78.00		4.65*
\$50,000 or >	29.10	33.50	22.00		
Education					
HS Grad or <	16.60	18.20	14.30		3.16
Trade School	42.20	44.80	38.70		
College/Univ	41.20	37.00	47.10		
Alcohol ^d					
High	41.70	47.60	31.60		2.48
Low	58.30	52.40	68.40		
Drug Highs					
High	31.80	40.10	18.40		15.33**
Low	68.20	59.90	81.60		
Age at 1 st Sexual Intercourse					
	16.62 (3.00)	16.39 (2.84)	16.98 (3.13)	-1.70	
Lifetime Sex Partners					
	31.70 (30.24)	39.06 (33.33)	19.85 (19.19)	4.73**	
Six Month ^e					
	3.30 (3.50)	3.54 (3.49)	2.92 (3.46)	2.02*	
Previous STI's					
Yes	46.7	45.1	48.2		0.28
No	53.3	54.9	51.8		
Relationship ^f					
Uncomm.	52.9	44.6	52.1		1.37
Comm.	47.1	55.4	47.9		

Note. N = 313. Missing data ranged from 11 to 13.

^aPerceived STI/HIV risk of a specific partner. ^bFirst time condom use with a specific partner. ^cCultural background.

^dAlcohol intoxication. ^eNumber of sexual partners in last 6 Months. ^fRelationship status.

* $p < .05$. ** $p < .01$.

Table 5

Intercorrelations Between Main Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 PSP Risk ^a	--																	
2 SB-Gen ^b	-.04	--																
3 SB-Spec ^c	-.03	.48	--															
4 OP Risk ^d	.21	-.12	-.07	--														
5 GCU ^e	.04	-.11	-.09	.17	--													
6 CUFIRST ^f	.01	-.06	.00	.04	.47	--												
7 Age	.10	-.12	.00	-.06	-.07	-.11	--											
8 Gender	-.03	.09	-.00	-.14	.01	-.12	.08	--										
9 Cul Back ^g	-.12	-.06	-.12	-.03	.06	.03	.03	.09	--									
10 Marital ^h	.14	-.01	-.01	-.22	-.12	-.00	.16	.09	.01	--								
11 Income	-.03	-.05	.03	-.24	-.15	-.09	.26	.18	.06	.29	--							
12 Education	-.12	-.08	.06	-.16	.07	.11	.09	-.10	.08	-.01	.16	--						
13 Alcohol ⁱ	-.04	.11	-.10	.09	.08	-.02	-.43	.15	.10	-.14	-.10	-.12	--					
14 Drug High	-.01	.05	-.09	.07	.05	-.01	-.26	.24	.02	-.02	-.18	-.24	.42	--				
15 Age1st SP ^j	.03	-.00	-.05	-.11	.04	.05	.05	-.10	-.05	-.04	.02	.20	-.14	-.17	--			
16 LifePart ^k	-.00	-.00	-.08	-.04	-.01	-.01	.40	.26	.13	-.05	.23	-.08	-.08	-.06	-.37	--		
17 SixMonth ^l	.06	.14	-.06	.16	.06	-.10	-.07	.12	-.03	-.11	.05	-.09	.26	.15	-.20	.39	--	
18 Previous ^m	.09	-.05	.01	.03	-.03	.02	.11	-.03	-.03	.02	-.00	-.08	.02	.10	-.17	.22	-.00	--
19 Rel. Stat ⁿ	.05	-.15	-.09	-.25	-.10	.05	.01	-.07	-.02	.39	.12	.13	.15	.06	.04	-.09	-.22	.05

Note. N = 313. Missing data ranged from 11 to 13.

^aPerceived STI Risk of a Specific Partner. ^bSTI Safety Beliefs-General. ^cSTI Safety Beliefs-Specific. ^dOwn Perceived STI Risk. ^eGeneral Condom Use.

^fCondom Use First Sexual Intercourse. ^gCultural Background. ^hMarital Status. ⁱAlcohol Intoxication. ^jAge First Sexual Intercourse. ^kLifetime Sexual Partners.

^lSexual Partners Last 6 Months. ^mPrevious STI's. ⁿRelationship Status.

Question 1: Endorsement of STI/HIV Safety Beliefs-General and Specific

The first research question asked what STI/HIV safety beliefs were endorsed by individuals when they evaluated the STI/HIV safety of sexual partners in general and when they evaluated the STI/HIV safety of a specific sexual partner. The level of agreement with STI/HIV safety beliefs-general scale statement items was considered to indicate the level of endorsement of safety beliefs in relation to sexual partners in general. The level of influence of STI/HIV safety beliefs-specific scale statement items was considered to indicate the level of endorsement of safety beliefs in relation to a specific sexual partner. STI/HIV safety beliefs-general statement item responses for “agree” and “strongly agree” were combined and recoded as an “agree” response for each STI/HIV safety beliefs-general scale statement item. STI/HIV safety beliefs-specific scale statement items for “moderate” and “strong influence” responses were combined and recoded as an “influential” response for scale statement item. Table 6 contains the frequencies for the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific statement item “agree” and “influential” responses. Statement items for both scales were considered according to theoretical categories; familiarity, trust, similarity, likeability, superficial traits, knowledge of partner’s sexual history, and relationship type (see Table 6). The more highly endorsed statement items for both scales fell under the theoretical category headings of familiarity, trust, superficial traits, likeability, sexual history, and relationship type.

For the STI/HIV safety beliefs-general scale, three of the four statement items theoretically deemed to fall into the “familiarity” category had a high frequency of endorsement; “I felt I knew the person” endorsed by 67% of participants, “The person was part of my circle of close friends” (58%) and “I knew about the person’s lifestyle” (68%). In the “trust” category both statement items were frequently endorsed; “I felt I could trust them” with a 70% endorsement, and “The person was a good person” (43%). In the “likeability” category, the item “I liked or loved the person” was endorsed by 45% of participants. Among the “superficial traits” category,

three items were frequently endorsed; “The person seemed intelligent/well-educated/responsible” with 52% endorsement, “The person looked healthy/clean (40%), “The person seemed like they hadn’t slept around” (44%). In the “sexual history” category both items were endorsed; “I felt I knew the person’s sexual history” with 64% endorsement, “The person said they thought they were safe” (40%). In the “relationship type” category, the item “The person was someone I considered myself serious about” was endorsed by 49% of participants. Of all the items, the least endorsed were “I knew the person’s friends” (29%) in the “familiarity” category, “The person came from a background similar to mine” (32%) in the “similarity” category, and “The person was physically attractive” (22%) in the “superficial traits” category.

For the STI/HIV safety beliefs-specific scale, of the statement items theoretically deemed to fall into the “familiarity” category two items were endorsed but at a lower frequency; “I felt I knew the person” endorsed by 48% of participants, and “I knew about the person’s lifestyle” (51%). In the “trust” category, both items were endorsed; “I felt I could trust them” (64%), and “I felt the person was a good person” (53%). In the “likeability” category, the item “I liked or loved the person” was endorsed by 45% of participants. In the “superficial traits” category, the same three items were frequently endorsed; “The person seemed intelligent/well-educated/responsible” with 48% endorsement, “The person looked healthy/clean (50%), “The person seemed like they hadn’t slept around” (53%). In the “sexual history” category both items were again endorsed; “I felt I knew the person’s sexual history” with 51% endorsement, “The person said they thought they were safe” (46%). In the “relationship type” category, the item “The person was someone I considered myself serious about” was endorsed by a lower percentage of participants (38%). In relation to a specific sexual partner two of the same items were least endorsed; “I knew the person’s friends” (28%), and “The person came from a similar background to mine” (26%). Although the attractiveness item was endorsed by only 22% of

participants when evaluating sexual partners in general, 41% of participants identified this item as influential when evaluating a specific partner.

Table 6

STI/HIV Safety Beliefs Scale Statement Items Frequencies and Differences

Theoretical Categories and Statement Items	STI/HIV Safety Beliefs (General and Specific ^a) Scale Statement Items Gen. (agreement) / Spec. (influence)	General Item "Agree" Frequency (%)	Specific Item "Influential" Frequency (%)	General and Specific Item Differences (%)	χ^2
Familiarity					
1.	I felt I knew the person	211 (67.4)	149 (47.6)	62 (19.8)	7.0**
2.	The person was part of my circle of close friends	180 (57.5)	98 (31.3)	82 (26.2)	16.0***
3.	I knew the person's friends	91 (29.1)	86 (27.5)	5 (1.6)	14.1***
4.	I knew about the person's lifestyle	213 (68.1)	158 (50.5)	55 (17.6)	17.3***
Trust					
5.	I felt I could trust them	220 (70.3)	201 (64.2)	19 (6.1)	27.3***
6.	I felt the person was a "good" person	134 (42.8)	166 (53.0)	-32 (-10.2)	24.2***
Similarity					
7.	The person came from a background similar to mine	99 (31.6)	81 (25.9)	18 (5.7)	17.5***
8.	The person had the same interests and values as me	125 (39.9)	104 (33.2)	21 (6.7)	33.3***
Likeability					
9.	I like or loved the person very much	142 (45.4)	141 (45.0)	1 (0.4)	32.4***
Superficial Traits					

		STI/HIV Risk Perception 64			
10.	The person was physically attractive	70 (22.4)	127 (40.6)	-57 (-18.2)	35.2***
11.	The person seemed intelligent/well-educated/responsible	163 (52.1)	150 (47.9)	13 (4.2)	30.4***
12.	The person looked healthy/clean	124 (39.6)	155 (49.5)	-31 (-9.9)	58.3***
13.	The person seemed like they hadn't slept around a lot	138 (44.1)	165 (52.7)	-27 (-8.6)	9.4*
Sexual History					
14.	I felt I knew the person's sexual history	201 (64.2)	159 (50.8)	42 (13.4)	14.5***
15.	The person said they thought they were "safe"	126 (40.3)	143 (45.7)	-17 (-5.4)	19.4***
Relationship Type					
16.	The person was someone I considered myself serious about	153 (48.9)	120 (38.3)	33 (10.6)	34.8***

Note. N = 313. Missing data ranged from 11 to 13.

^a For STI/HIV safety beliefs-specific scale statement items, participants had the choice of circling one of two verb phrases (e.g. knew / did not know) to make statement items relevant to their specific partner.

** $p < .01$. *** $p < .001$.

Question 2: STI/HIV Safety Beliefs Scale Statement Item Differences

Frequency and percentage differences were calculated between the recoded "agree" category for the STI/HIV safety beliefs-general scale statement items, and the recoded "influential" category for the STI/HIV safety beliefs-specific scale statement items. These are presented in Table 6. Scale statement items showing the largest differences were item 1, "I felt I knew the person" (19.8%); item 2, "The person was part of my circle of close friends" (26.2%); item 4, "I knew about the person's lifestyle" (17.6%); and item 10, "The person was physically attractive" (-18.2%).

According to Table 6, eleven statement items showed greater frequency of endorsement for sexual partners in general, and nine statement items showed greater frequency of endorsement for a specific partner. Item 10 was the only item that showed a large negative difference (-18.2%) indicating that more participants considered physical attractiveness influential when evaluating the safety of a specific partner than when considering sexual partners in general.

A Pearson Chi-Square analysis, using the “agree” and “disagree” categories for STI/HIV safety beliefs-general scale statement items and “no influence” and “influential” categories for STI/HIV safety beliefs-specific scale statement items, was conducted. As indicated in Table 6, all differences between the statement items in the two scales were found to be statistically significant, only one at $p < .05$, all the others at $p < .01$ or $.001$.

Question 3: Demographic and Background Factors Predicting STI/HIV Safety Beliefs

To examine the influence of demographic and background factors on the STI/HIV safety beliefs-general scale scores and on the STI/HIV safety beliefs-specific scale scores, two linear regression analyses were performed. For the STI/HIV safety beliefs-general model, STI/HIV safety beliefs-general scale scores were used as the dependent variable. Independent variables were chosen using the Hosmer-Lemeshow method. Using this method, only variables with correlational p values less than .25 are included in the model. Nine demographic and background factor variables met this criterion and were included as explanatory variables in the model. These variables were age, gender, education, general condom use, number of sexual partners in the last six months, age at first sexual intercourse, relationship status, and alcohol intoxication. Education was treated as a “dummy” variable with some or completed trade school and some university used as the reference group. Therefore high school graduation or less and university degree or higher represented the levels of education entered into the model. The variable, number of sexual partners in the last six months, was recoded with category midpoint values used for all subjects. Alcohol intoxication was recoded into high and low frequency of

intoxication as described previously. Relationship status was also recoded with one of the original response choices "other" treated as a missing case because the level of relationship commitment could not be determined. This resulted in a smaller sample size for both regression models ($N=259$ for STI/HIV safety beliefs-general, and $N=251$ for STI/HIV safety beliefs-specific).

For the STI/HIV safety beliefs-specific model, STI/HIV safety beliefs-specific scale scores were used as the dependent variable. Six variables met the Hosmer-Lemeshow criteria for inclusion as explanatory variables in this model. These included; cultural background, general condom use, number of lifetime sexual partners, relationship status, alcohol intoxication, and drug highs. Number of lifetime sexual partners, alcohol intoxication, drug highs, and relationship variables were recoded as described previously.

The assumptions that the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific scale scores were independent and normally distributed were confirmed with diagnostic tests. The ANOVA test for significance of both STI/HIV safety beliefs models indicated that the models fit the data with significance levels of $p < .02$ and $p < .05$ respectively. For both models, all variables were entered simultaneously. The regression of the STI/HIV safety beliefs-general scores on 9 predictor variables accounted for only 8 % of the variance with the regression of STI/HIV safety beliefs-specific scores on 6 predictor variables accounting for 5%. Age, general condom use, and number of sexual partners in the last 6 months were significantly related to STI/HIV safety beliefs-general scores at a significance level of $p < .05$. Relationship status was also significant at $p < .01$.

Unlike the results for the STI/HIV safety beliefs-general model, there were no variables significantly related to STI/HIV safety beliefs-specific scale scores. Only three variables (general condom use, relationship status, and alcohol intoxication) were common to both models. Results for both models are reported in Table 7.

Table 7

**Summary of Regression Analysis for Variables Predicting
STI/HIV Safety Beliefs-General
(N = 259)**

Explanatory Variable	Unstandardized Coefficients B	Standard Error B	Standardized Coefficients Beta
(Constant)	63.82	7.23	
Age	-0.24	0.10	-.16*
Gender	01.60	1.71	0.06
Education ¹			
HS Grad or <	-0.13	2.22	0.00
Col./University	0.60	1.84	0.02
Degree or >			
General Condom Use	-0.06	0.23	-0.15*
Sexual Partners Last 6 Months	0.45	0.23	0.13*
Age at 1 st Sexual Intercourse	-0.10	0.31	-0.02
Relationship Status	-3.75	1.65	-0.14**
Alcohol Intoxication	-1.33	1.86	-0.05

Note. $R^2 = .08$. ¹Reference group is trade school or some college/university.
* $p < 0.05$. ** $p < 0.01$.

**Summary Regression Analysis for Variables Predicting
STI/HIV Safety Beliefs-Specific
(N = 251)**

Explanatory Variable	Unstandardized Coefficients B	Standard Error B	Standardized Coefficients Beta
(Constant)	62.14	3.30	
Cultural Background	-3.12	2.00	-0.10
General Condom Use	-0.02	0.02	-0.06
Lifetime Sexual Partners	-0.04	0.02	-0.11
Relationship Status	-2.70	1.43	-0.12
Alcohol Intoxication	-2.10	1.50	-0.09
Drug Highs	-0.90	1.53	-0.04

Note. $R^2 = .05$.

Question 4: STI Safety Beliefs-General, Perceived Risk, and Condom Use

To determine the relationships between the endorsement of STI/HIV safety beliefs-general, an individual's own perceived STI/HIV risk, and general condom use, a Pearson's product-moment correlation (reported in Table 5) was examined. For the relationship between STI/HIV safety beliefs-general scale scores and own perceived STI/HIV risk, a small but significant negative correlation ($r = -.12$) was found indicating that as STI/HIV safety beliefs-general scale scores increased, own perceived STI/HIV risk decreased. The relationship between STI/HIV safety beliefs-general scores and general condom use was not statistically significant ($r = -.11$). A small, but significant positive correlation ($r = .17$) was found between own perceived STI/HIV risk and general condom use indicating that as an individual's own perceived STI/HIV risk increases, so does his/her use of condoms.

For condom use within the last 6 months, 61% of participants indicated that they used condoms at least 75% of the time ($M = 55.61$, $SD = 31.00$). Participants were also asked to indicate factors (alcohol, drugs, heat of the moment, condom availability, partner did not want to use) that may have contributed to non-condom use in the past six months. Of these factors, 48% of participants identified alcohol, 20% drugs, 64% heat of the moment, 34% no condom available, and 34% identified the partner as influential in not using a condom. See Table 5 for variable correlation coefficients.

Question 5: STI/HIV Safety Beliefs-Specific, Perceived Partner Risk, and Condom Use

When considering a specific partner, Pearson's product-moment correlation was examined to determine the relationships between STI/HIV safety beliefs-specific scale scores, perceived STI/HIV risk of a specific partner, and first time condom use with that partner. No significant relationships were found between any of these variables. Correlation coefficients were as follows; STI/HIV safety beliefs-specific scale scores and perceived STI/HIV risk of a specific partner ($r = -.03$), STI/HIV safety beliefs-specific scale scores and first time condom use with a

specific partner ($r = .00$), and perceived partner STI/HIV risk and first time condom use with a specific partner ($r = .01$).

Despite participants reporting a low mean percentage rating ($M = 34.11$; $SD = 27.39$) of the likelihood that their partner was infected with an STI, 60% reported using condoms during the first sexual encounter with their partner. As above, participants were asked to identify factors influencing non-condom use during the first sexual encounter with their partner. Of these factors, 21.5% of participants identified alcohol, 9.2% drugs, 33.1% heat of the moment, 14.5% no condom available, and 12.2% identified their partner as influential in not using a condom.

CHAPTER 5: DISCUSSION

This final chapter begins with a summary of the main findings of this study followed by a detailed discussion of the findings and their relevance to the existing STI/HIV literature. Findings are discussed in relation to the endorsement of STI/HIV safety beliefs, the impact of demographic characteristics and background factors on STI/HIV safety beliefs, and safety beliefs in relation to perceived risk and condom use. Following, is an overview of the limitations of this study. The chapter concludes with a discussion of the implications these findings have for STI/HIV clinical nursing practice and future research.

Summary of Findings

The evidence presented in this study demonstrates that individuals are using factors related to relationship characteristics and partner attributes (STI/HIV safety beliefs) to determine the STI/HIV safety (uninfected status) of a sexual partner both when considering sexual partners in general and when considering a specific sexual partner. The more highly endorsed statement items fell into the theoretical categories of familiarity, trust, likeability, superficial traits, sexual history, and relationship type. There were significant differences between the frequency of endorsement of statement items when considering sexual partners in general and when considering a specific sexual partner, however the study design may have contributed to these differences.

In terms of demographic and background factor influences on STI/HIV safety beliefs, four of nine explanatory variables (age, general condom use, number of sexual partners, relationship status) in the STI/HIV safety beliefs-general model were predictive of STI/HIV safety beliefs-general scale scores, however none of the six explanatory variables in the STI/HIV safety beliefs-specific model were found to be predictive of STI/HIV safety beliefs-specific scale scores. Overall, only 8% of the variance in STI/HIV safety beliefs-general model, and 5% of the

variance in STI/HIV safety beliefs-specific model, was explained by demographic and background factors.

When considering sexual partners in general, own perceived STI/HIV risk was significantly correlated with STI/HIV safety beliefs-general scores and general condom use. When considering a specific sexual partner, no significant relationships were found between STI/HIV safety beliefs-specific scores, perceived STI/HIV risk of a specific sexual partner and first time condom use with that partner.

Endorsement of STI/HIV Safety Beliefs

Participants in this study were asked to identify whether or not they used factors related to partner attributes and relationship characteristics (factors previously shown to be unreliable determinants of STI/HIV risk) to evaluate the STI/HIV safety of sexual partners in general, and in relation to a specific sexual partner. These factors were presented as 16 statement items to which participants assigned a level of endorsement. Statement items were considered according to theoretical categories: familiarity, trust, similarity, likeability, superficial traits, knowledge of partner's sexual history, and relationship type (see Table 6). The statement items most frequently endorsed for both sexual partners in general and a specific sexual partner were in the theoretical categories of familiarity, trust, likeability, superficial traits, sexual history, and relationship type.

Familiarity

In relation to sexual partners in general, three of the four statement items deemed to fall into the "familiarity" category had a high frequency of endorsement (knew the person, part of close circle of friends, knew the person's lifestyle). From these results it appears that once participants feel they "know" their sexual partner, they believe they are better able to judge that partner's risk despite the fact that they have no objective information about that partner's STI/HIV risk status. These results are consistent with previous research findings indicating that

people who felt they “just knew” their partner, also judged the partner to be safe even in the absence of any objective definitive evidence (Fisher & Fisher, 1997; Fortenberry et al., 2002; Maticka-Tyndale, 1991; Misovich et al., 1996). In relation to a specific partner, the same items were endorsed although at lower frequencies. This is consistent with several qualitative studies (Hammer et al., 1996; Skidmore & Hayter, 2000; Swann et al., 1995; Williams et al., 1992) that have shown that in relation to a specific partner, people endorse the belief that known partners are safe partners. The endorsement of these familiarity factors both when considering sexual partners in general and when considering a specific sexual partner lend support to the assertion that early STI/HIV prevention messages which promoted the advice to “know your partner well,” may have been misinterpreted to mean that cursory knowledge about a sexual partner is sufficient to determine that partner’s STI/HIV risk.

Trust

In the “trust” category, both statement items (I felt I could trust them, the person was a good person) were frequently endorsed when considering sexual partners in general and when considering a specific sexual partner. This indicates that trust is influential when evaluating the safety of sexual partners. These results are consistent with previous research by Thornbury et al. (2005) who found that participants not only endorsed the trusted partners are safe partners heuristic but also found that this belief was associated with a lower percentage of condom use. Misovich et al. (1997) and Gebhardt et. (2003) have also shown that once partners in a relationship have begun to trust each other, they often decide it is safe to assume their partner has not engaged in risky sexual behaviours. In addition, some studies (Fisher & Fisher, 1997; Fortenberry et al., 2002; Maticka-Tyndale, 1991; Misovich et al., 1996) have shown that once people feel they can trust their partner they assume their partner is safe even when evidence indicates they may not be safe. Clark et al. (1996) found that women, who knew their partners had been unfaithful, still trusted that these partners would not be sources of STI/HIV

transmission. Skidmore and Hayter's (2000) findings indicated that the trustworthiness of a partner was one of the most important influential factors cited by participants for engaging in unprotected sex.

Likeability

The one item (I liked or loved the person) in the "likeability" category was frequently endorsed when considering sexual partners in general and when considering a specific sexual partner. This finding is consistent with previous research which has shown that when individuals develop affectionate feelings toward a partner, the likelihood that the partner will be viewed as a potential source of disease is reduced (Kelly & Kalichman, 1995; Williams et al., 1992). Clark et al.'s (1996) findings also indicated that women who were experiencing passionate involvement with a partner were more likely to downplay the partner's risk than women who were not experiencing passionate involvement. Feelings of attraction and affection therefore may cause individuals to lose sight of salient health issues such as STI/HIV infections and consequently, the partner is not seen as a potential source of infection.

Superficial Traits

In the "superficial traits" category three items (person seemed intelligent/well-educated/responsible, person looked healthy/clean, person seemed like they hadn't slept around) were frequently endorsed when considering sexual partners in general and when considering a specific sexual partner. Based on previous research findings, it was expected that the attractiveness item would garner a higher level of endorsement, especially when considering that 96% of participants in this study rated their specific sexual partner as attractive. However, overall these findings are consistent with previous research that has shown that superficial traits are relied upon as a method for selecting safe sexual partners (van der Plight et al., 1993; Fisher & Fisher, 1997). McDonald et al.'s (2001) findings also showed that the STI/HIV prevention method most commonly used by individuals, was selecting a safe partner based on appearance.

Sexual History

In the “sexual history” category, both items were endorsed by a high proportion of participants (felt they knew the person’s sexual history, person said they thought they were safe) in relation to sexual partners in general and in relation to a specific sexual partner. It is evident that the belief that one knows a partner’s sexual history is influential in evaluating sexual safety. However, believing that one knows a partner’s sexual history is different from accurate knowledge of that partner’s sexual history based on objective evidence.

One major taboo subject identified in the literature, especially during impression formation, is the discussion of one’s previous sexual activities (Comer & Nemeroff, 2000; Gold & Skinner, 1992; Misovich et al., 1997). Research findings indicate that many would rather not disclose their sexual history for fear of appearing more dangerous or risky to potential partners, particularly if self-disclosure is seen as a potential threat to a relationship. The result is often a sexual interaction that is characterized not only by indirect and ambiguous communication, but also by indirect information gathering (Williams et al., 1992). Research findings indicate that although people may vaguely ask about their partner’s sexual history, very few actually ask directly about STI’s or HIV (Crosby, Yarber, & Meyerson, 2000). Furthermore, those who have been tested for STI’s are often reluctant to ask their partners about testing or share their results when starting a new relationship (Wolitski & Branson, 2002).

Relationship Type

The one item (the person was someone I was serious about) in the “relationship type” category was frequently endorsed by participants when considering sexual partners in general. This is in agreement with previous research which has indicated that the nature of a relationship between two people has been shown to influence risk perception and subsequently condom use (Kershaw et al., 2003; Misovich et al., 1997). For example, many commonly assume that individuals who are in a more serious type of relationship are at a lower risk for STI’s due to

greater perceived STI/HIV safety (Hammer et al., 1996; Poppen & Reisen, 1995). Misovich et al. (1997) assert that this has contributed to a false sense of security as few people in closer relationships can be certain that they are not at risk for transmitting or becoming infected with an STI or HIV. Other studies (Comer & Nemeroff, 2000; Kershaw et al., 2003) have also shown that the type of sexual relationship (casual/uncommitted versus serious/committed) was used to assess STI/HIV risk with those engaging in unprotected sex reporting little risk for an STI/HIV if they were with a long-term partner.

Endorsement Differences for Sexual Partners in General and a Specific Sexual Partner

Analysis of the results of this study confirmed that there were significant differences between the frequencies of endorsement of statement items when evaluating sexual partners in general and when evaluating a specific sexual partner. The largest differences were found between the statement items theoretically deemed to fall into the familiarity category (knew the person, the person was part of my close circle of friends, and knew about the person's lifestyle) and into the superficial traits category (attractiveness). These findings agree with previous research that has suggested the physical and emotional components of interpersonal dynamics may overcome a person's cognitive assessment of risk when individuals evaluate STI/HIV risk in relation to a specific sexual partner (Agocha & Cooper, 1999; Fisher & Fisher, 1996; Gerrard et al., 1996; Kelly & Kalichman, 1995). Evidence for the influence of context on decision-making is also seen in studies examining differences between intended versus actual reported sexual behaviour (Abraham et al, 1996).

In this study, six of the statement items showed an increased frequency of endorsement whereas 10 statement items showed a decreased frequency of endorsement when evaluating a specific sexual partner. Based on qualitative research findings to date, it was expected that the majority of statement items would have been more frequently endorsed when considering a specific sexual partner. Two limitations in the design of this study may have contributed to these

unexpected findings. Firstly, when creating the STI/HIV safety beliefs scales, the corresponding middle numeric category labels on the two Likert scales differed. Although it was recognized that the “neither agree nor disagree” and the “some influence” category labels differed conceptually, the primary interest was in those participants choosing the “moderate” and “strong” categories for both STI/HIV safety beliefs scales. However for the STI/HIV safety beliefs-specific scale, a larger percentage of participants chose the middle “some influence” category which was recoded as “no influence”, than the corresponding numeric category “neither agree nor disagree” for the STI/HIV safety beliefs-general scale, which was recoded as “disagree.” It appears therefore, that the scales conceptual differences may have contributed to the lower frequency of endorsement when considering a specific sexual partner. In retrospect, more reliable results may have been produced if the labelling of these categories had been conceptually similar. Secondly, to make each statement item relevant to their specific partner, participants were asked to choose either an affirmative or negative verb phrase (e.g. knew / did not know the partner). Although it was hypothesized that the choice of verb phrase would not be influential in the level of endorsement of these statement items, it is possible that the choice of verb phrases may have affected the level of endorsement of these statement items. For example, participants reporting that they felt they knew their partner may have more strongly endorsed this statement as influential than those reporting they did not know their partner.

Overall, findings from this study support previous research that indicates a high percentage of individuals are relying on STI/HIV safety beliefs when evaluating the STI/HIV safety of sexual partners. However the differences between the frequency of the endorsement of factors when considering sexual partners in general and a specific sexual partner require further research.

The Impact of Demographic and Background Factors on STI/HIV Safety Beliefs

Background factors such as the number of sexual partners, age at first sexual intercourse, and condom use have often been cited as significant predictors of perceived STI/HIV risk and risky sexual behaviour (Maticka-Tyndale, 1997). In the present study, the predictive value of demographic characteristics and background factors were examined in relation to the endorsement of safety beliefs when considering sexual partners in general (STI/HIV safety beliefs-general scale scores) and a specific sexual partner (STI/HIV safety beliefs-specific scale scores). For sexual partners in general, a total of nine explanatory variables were entered into the linear regression model with the STI/HIV safety beliefs-general scale score used as the response variable. The model pointed to four significant predictor variables associated with STI/HIV safety beliefs-general scale scores: age, general condom use, number of sexual partners in the last six months, and relationship status. Higher STI/HIV safety beliefs-general scale scores, which indicated a higher endorsement of statement items, were associated with a lower age, increased number of sexual partners, and uncommitted relationships, while lower scores were associated with a higher percentage of general condom use. Findings from the present study are consistent with Clark et al.'s (1996) findings, which showed that STI/HIV safety beliefs scores were significantly correlated with decreased condom use in the previous six months. To date, Clark et al. (1996) have been the only researchers to examine STI/HIV safety beliefs. Qualitative findings have also shown that participants who endorse partner safety beliefs are also those who generally report a higher number of sexual partners and decreased condom use (Offir et al., 1993; Williams et al., 1992). Although relationship status was identified as a significant predictor of STI/HIV safety beliefs-general scale scores, no previous study was found that specifically examined the influence of committed versus uncommitted relationships on partner safety beliefs. However, only 7% of the variance in STI/HIV safety beliefs-general

model was explained by the demographic and background factors. Further research is indicated that probes possible predictors of beliefs about the safety of sexual partners.

For a specific sexual partner, six explanatory variables were entered into the linear regression model with the STI/HIV safety beliefs-specific scale score used as the response variable. In contrast to the STI/HIV safety beliefs in relation to sexual partners in general model, the STI/HIV safety beliefs in relation to a specific partner model did not identify any significant predictor variables. Based on these findings, it would appear that demographic characteristics and background factors are not associated with the endorsement of STI/HIV safety beliefs in relation to a specific partner.

STI/HIV Safety Beliefs, Perceived Risk, and Condom Use

Findings from this study indicate that an individual's own perceived STI/HIV risk was significantly associated with STI/HIV safety beliefs-general and condom use within the last six months whereas perceived STI/HIV risk of a specific sexual partner was not significantly related to STI/HIV safety beliefs-specific or first-time condom use with that sexual partner. We found that as STI/HIV safety beliefs-general scale scores increased, an individual's perception of risk decreased. This finding indicates that participants who had higher levels of endorsement of STI/HIV safety beliefs perceived their own STI/HIV risk to be lower. In addition, participants who perceived their own risk of contracting an STI/HIV to be high were also found to use condoms more frequently during sexual intercourse encounters.

Previous research findings have been inconsistent in showing a relationship between own perceived STI/HIV risk and safer sexual behaviour. It has been argued that the conceptualization of own perceived STI/HIV risk is problematic because people generally do not perceive themselves as personally susceptible to STI/HIV (Bauman & Siegel, 1987; Kershaw et al., 2003). Some researchers (Clark et al., 1996; Fisher & Fisher, 1997) have suggested that conceptualizations of perceived STI/HIV risk that are specific to a particular

partner at a particular time would enable a better assessment of the impact of perceived risk on safer sexual behaviour. Findings from the present study do not support recent arguments about specific partner risk but support previous research findings which have indicated that own perceived STI/HIV risk is related to safer sexual behaviour.

Although these correlational results provide support for a relationship between the concepts of own perceived STI/HIV risk and safer sexual behaviour, Weinstein and Nicolich (1993) point out that correlations between risk perception and safer sexual behaviour should be interpreted with caution. Correlations using cross-sectional data can only be used to assess the accuracy of one's personal risk perception at the time, and should not be used to assess the causative effects of perceptions on behaviour. These authors caution that in order to examine whether risk perception motivates later behaviour, researchers must employ a longitudinal design.

Furthermore, as cited by Poppen and Reisen (1997) many studies have compared the perception of risk in the future to behaviour in the past and although one can calculate the correlations between future risk perception and past behaviour, such correlations do not prove causation. In this study the cross-sectional design and the temporal ordering of the variables both limit the interpretation of the results.

Findings related to a specific partner did not show associations between STI/HIV safety beliefs-specific scale scores, the perceived STI/HIV risk of the specific partner, or first time condom use with that specific partner. Based on the qualitative findings cited in the literature review, it was expected that significant relationships between these variables would be found. However, the nonsignificant finding between perceived STI/HIV risk of a specific partner and condom use is consistent with similar cross sectional research. In a study conducted by Reisen and Poppen (1999) examining partner specific risk perception, findings showed that perceived STI/HIV risk of a specific partner was not significantly related to self-protective behaviour (condom use). Interestingly, these authors acknowledged the limitations of their cross-sectional

design and the problems associated with the temporal ordering of the risk perception and sexual behaviour variables. To overcome this weakness, these authors conducted a second study examining partner specific risk perception employing a longitudinal design. In this design, risk perception was measured one month before the assessment of self-protective behaviour to strengthen the causal link between the two variables. Their second study indicated that the perception of risk associated with a specific partner was predictive of condom use with that partner one month later.

The finding that STI/HIV safety beliefs-specific scale scores and first time condom use were not associated was expected. Although participants may have endorsed the STI/HIV safety beliefs in relation to a specific partner, and used these to evaluate the safety of their partner, the final safety evaluation (safe or risky) was unknown. For example, participants who endorsed the safety beliefs may have determined that their partner was safe and therefore decided not to use condoms, however they may have also determined their partner was risky and used condoms. Also, a possible explanation for the lack of relationship between STI/HIV safety beliefs-specific and perceived STI/HIV risk of a specific partner may concern the different levels of endorsement caused by the verb phrase choices. For example, those who chose an affirmative verb phrase (e.g. knew the partner) may have more strongly endorsed the statement items than those who chose a negative verb phrase (e.g. did not know the partner). Overall, as the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific scales were developed for this study, the interpretation of the scale scores is limited. Separate examination of the relationship between each theoretical category, or each statement item and risk assessment and condom use may provide a better understanding of sexual decision making. Also, for each statement item in the STI/HIV safety beliefs-specific scale, separate examination of the affirmative and negative verb phrases may yield more valuable information.

Limitations of the Study

When considering the results of this study, it is important to recognize that this study had several limitations. First, a concern arises from the correlational design of the study. As suggested by Polit and Hungler (1999), correlational designs are inherently weaker than experimental studies in elucidating causal relationships. A longitudinal study, which collects data at more than one point in time would provide stronger support for causal links between study variables.

Second, the use of investigator-designed scales and items, developed from other established measures, must also be recognized as a potential limitation of this research. Although face validity was obtained from STI/HIV experts, and the STI/HIV safety beliefs-general and STI/HIV safety beliefs-specific scales were found to have good internal consistency (Cronbach's alphas equal to .92 and .87 respectively), the instrument was newly developed and consequently unvalidated. Further reliability and validity assessments of this instrument are therefore needed. A third limitation is the reliance on self-reports. One of the weaknesses of self-report measures concerns the validity and accuracy of the self-reports. Although anonymity was maintained by having no identifying information on the questionnaire, having participants answer the questionnaire in private, and having completed questionnaires returned in a sealed envelope, it was not possible to determine whether or not participants were willing to portray their sexual behaviour accurately. Self-reports of sensitive information, particularly sexual information, provide participants with the opportunity to embellish their risk perceptions or their use of condoms in order to conform to current social expectations regarding sexual behaviour. Therefore the results of this study may be subject to social desirability response bias (Polit & Hungler, 1999).

Fourth, the fact that data used in this study was retrospective in nature raises questions about recall bias. Recall biases may have contributed to inaccuracies in the data collection as

participants were required to recall information related to risk perception and sexual behaviours over a six month time period. Researchers (Poppen & Reisen, 1997; Weinstein & Nicolich, 1993) have found that participants can more accurately report behavioural information over a shorter time period (e.g. a 4 week time period). Risk perception reported in this study may have been more indicative of risk perception at the time of completing the questionnaire rather than at the time of the sexual encounter.

Lastly, although participants were asked to evaluate the same partner for all questions pertaining to a specific partner, there is no evidence to indicate that they had done so. Therefore, the results pertaining to the STI/HIV safety beliefs-specific scale scores, and to perceived STI/HIV risk of a specific sexual partner may have been compromised.

Recommendations

For those who do not have an STI or HIV, every sexual encounter represents a potential risk. Although there are behavioural strategies that are effective in reducing the risk of STI/HIV transmission, many continue to engage in high risk behaviours. Previous research has indicated that many people are selecting partners they believe are safe however, the success of this strategy is dependent on each partner having accurate knowledge of their own STI/HIV status and the ability to accurately disclose their status to each other. As this study shows that a high proportion of participants are using partner attributes and relationship characteristics to determine sexual partner safety, several key implications for STI/HIV prevention education and further research are suggested.

The results of this study indicate that re-education of the public about the dangers of superficial assessment of a sexual partner's safety is required. Prevention campaigns need to acknowledge that people are likely to evaluate sexual partners whom they know and trust as safe. Health care professionals must emphasize that the reliance on STI/HIV safety beliefs rather than STI/HIV testing is problematic as the risk of infection is always present no matter

how well intentioned the partner. Targeting these assumptions and exposing potentially faulty beliefs about the ability to select safe partners is needed to promote safer sexual behaviour.

Current risk reduction interventions focus largely on an individual's assessment of their own STI/HIV risk and to date the context of the relationship has been much neglected. Findings from this study showed that participants' safety beliefs differed when considering sexual partners in general versus a specific sexual partner. These findings indicate that prevention efforts must begin to acknowledge that feelings toward a sexual partner may reduce the impact of health-related information and make it less likely that sexual partners will be viewed as a health threat. Health care professionals need to place a greater emphasis on individuals in the context of a relationship.

Although the majority of participants indicated that knowing the partner was influential in evaluating partner safety, research shows that sexual communication is often indirect and ambiguous with few asking directly about a partner's sexual history. Healthcare professionals need to acknowledge that communication between sexual partners about sex is generally difficult and typically occurs in such a way as to enhance not undermine trust. Promoted communication should include routine questioning of partners about risk behaviour and infection status, risk disclosure and discussion of STI/HIV testing. These measures, together with efforts to overcome the associated stigma, could enhance individual skills and self-efficacy in such risk discussions and generate greater awareness of partner risk behaviours and adherence to strategies that reduce the risk of STI/HIV transmission.

More research using both the concept of an individual's own perceived STI/HIV risk and the concept of the perceived STI/HIV risk of a specific partner is needed to clarify the influence these have on safer sexual behaviour. Using multiple measures for the perceived STI/HIV risk of the partner may provide more reliable results. These could include knowledge of the partner's

sexual experience, STI history, HIV status; STI/HIV testing history and the accuracy of this information.

The limitations of this study suggest areas requiring further investigation. More rigorous quantitative research is needed to confirm qualitative findings. As much of the STI/HIV research has utilized a cross sectional design and methods that have correlated past behaviour with future risk perception, findings have been inconsistent and have not supported a relationship between risk perception and safer sexual behaviour. Research employing a longitudinal design in which current risk perception is examined for its relationship to subsequent behaviour is needed to establish a causal link.

More research examining the influence of relationship factors (the levels of commitment and trust) is needed as findings from this, and other studies suggest that these factors can affect risk perception and the probability of engaging in safer sexual behaviour (Fortenberry et al., 2002). As risky sexual behaviour within a relationship is often seen as a symbol of one's trust and commitment, and taking risks is considered a part of building a closer relationship, further investigation is required to elucidate the influence of relationship factors on risk perception, and subsequently safer sexual behaviour.

Much of the prevention information to date has not considered the complexities of human sexuality, and in particular the compelling nature of sex, which may diminish people's cognitive and emotional ability to make rational risk assessments. This has led to an overestimation of peoples' ability to follow risk reduction recommendations despite being knowledgeable about STI/HIV prevention strategies. Further research which integrates findings from human sexuality research is needed to understand the many psychological, cultural, arousal, and situational influences that form the context of human sexual behaviour before change can be expected (Kelly & Kalichman, 1995).

Conclusion

While sexual safety or the avoidance of contracting a sexually transmitted disease is an important component of sexual health for the majority of sexually active Canadians, many continue to engage in risky sexual behaviours. Findings from this study and previous studies show that the information that many individuals use to evaluate STI/HIV risk is of questionable value and is the result of faulty inferences based on partner attributes and relationship characteristics. Arguments have been presented that conceptualizations of perceived STI/HIV risk need to focus on the risk posed by a specific sexual partner rather than on a generalized perception of personal STI/HIV risk currently found in most health behaviour models. However, results from this study, indicating that own perceived STI/HIV risk was significantly correlated to condom use whereas no correlation was shown between the perceived STI/HIV risk of a specific partner and first time condom use with that partner, tend to support existing health behaviour models. Overall, there is evidence that a substantial percentage of people are using partner selection strategies based on unreliable information. Therefore changes are needed in prevention education strategies and further research examining the influences on sexual decision making is indicated.

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Appendix A

Letter of Introduction

THE UNIVERSITY OF BRITISH COLUMBIA

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Sexual Decision Making Study

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Dear STD clinic client:

The purpose of this study is to collect information about how STD clinic clients decide whether or not a sexual partner could have a sexually transmitted disease (STD). We are hoping that this information will help us better understand how people make decisions when they are thinking about having sex. We will use this information to improve our STD health teaching and hope this will decrease the number of people who get STD's. This is research for a Master of Science in Nursing degree thesis for the School of Nursing, University of British Columbia.

You will be eligible to participate in this study if:

- you consider yourself to be heterosexual
- all of your sexual partners within the last 6 months have been of the opposite sex
- you are older than 18 years of age
- you have had penile/vaginal (penis in the vagina) or penile/rectal (penis in the rectum or behind) within the last 6 months
- you do not have HIV as far as you know
- you can understand written and spoken English

Appendix C

Sexual Decision Making Questionnaire

Sexual Decision Making QUESTIONNAIRE

THE UNIVERSITY OF BRITISH COLOUMBIA

Many of the questions in this questionnaire are about Sexually Transmitted Infections (STIs) including HIV, and your beliefs about them. Some questions will ask about your background. All your answers will remain anonymous and will not be linked back to you in any way. There are no right or wrong answers, only your own individual opinions. We realize that some of these questions are very personal but your answers are very important to this research project. Please answer all the questions. Do not put your name on any part of this questionnaire.

By handing in this questionnaire you are consenting to participate in this study.

SECTION

1

Sexual Decision Making

Today's Date: _____

The questions in this section are about how you decide if a sexual partner is 'safe' or uninfected with a sexually transmitted infection. Please answer each question. When we say "sexual intercourse" in this questionnaire we mean sex where the penis is put into vagina or sex where the penis is put into the rectum (the behind).

1. Please place an X on the line below to indicate how important it is to you, to choose a sexual partner that is 'safe' (not infected with an STI/HIV)?

2. Please tell us how much you agree or disagree with the following 16 statements below, by circling the numbers using the 1 to 5 scale.

Please begin each statement with...

"In general, I would be pretty sure that a person I was considering as a sex partner was safe (did not have an STI) if ..."

	1 Strongly Disagree	2 Moderately Disagree	3 Neither Agree nor Disagree	4 Moderately Agree	5 Strongly Agree
1. I felt I knew the person	1	2	3	4	5
2. The person was part of my circle of close friends	1	2	3	4	5
3. I knew the person's friends	1	2	3	4	5
4. I knew about the person's lifestyle	1	2	3	4	5
5. I felt I could trust them	1	2	3	4	5
6. I felt the person was a "good" person	1	2	3	4	5
7. The person came from a background similar to mine	1	2	3	4	5
8. The person had the same interests and values as me	1	2	3	4	5
9. I liked or loved the person very much	1	2	3	4	5
10. The person was physically attractive	1	2	3	4	5
11. The person seemed intelligent/well-educated/responsible	1	2	3	4	5
12. The person looked healthy/clean	1	2	3	4	5
13. The person seemed like they hadn't slept around a lot	1	2	3	4	5
14. I felt I knew the person's sexual history	1	2	3	4	5
15. The person said they thought they were 'safe'	1	2	3	4	5
16. The person was someone I considered myself serious about	1	2	3	4	5

SECTION

2

Sexual Decision Making

In this section please answer the following questions while thinking about a sexual partner in the last 6 months **that may have created some risk for you (i.e. possibly exposed you to an STI)**. We are interested in finding out how likely you thought it was (at the time you were first thinking of having sexual intercourse) that this partner could have been infected with an STI/HIV and what factors may have influenced your thoughts.

3. Please place an X on the line below to indicate how likely you thought it was (at the time you were thinking of having sexual intercourse), that this partner could have been infected with an STI/HIV?

4. The following is a two-part question. Please answer this question while thinking about the **SAME PARTNER** as in question 3.

Part 1

Read each of the 16 statements on page 5 and circle the phrase (in brackets) that best describes this sexual partner

Example:

1. I felt I (knew / did not know) this person

Part 2

Now consider each of the 16 statements again and indicate by circling the numbers below (using the 1 to 5 scale), the amount of influence (No influence to Strong influence) you feel each statement had on your thoughts at that time, about your partner's safety.

Example:

1 2 3 4 5

Some
Influence

	1 No Influence	2 Slight Influence	3 Some Influence	4 Moderate Influence	5 Strong Influence
1. I felt I (knew / did not know) this person	1	2	3	4	5
2. This person (was / was not) part of my close circle of friends	1	2	3	4	5
3. I (knew / did not know) this person's friends	1	2	3	4	5
4. I (knew / did not know) about this person's lifestyle	1	2	3	4	5
5. I felt I (could trust / could not trust) this person	1	2	3	4	5
6. I felt this person (was / was not) a "good" person	1	2	3	4	5
7. This person (came / did not come) from a background similar to mine	1	2	3	4	5
8. This person (had / did not have) the same interests and values as me	1	2	3	4	5
9. I (liked or loved / did not like or love) this person very much	1	2	3	4	5
10. This person (was / was not) physically attractive	1	2	3	4	5
11. This person (seemed / did not seem) intelligent / well-educated / responsible	1	2	3	4	5
12. This person (looked / did not look) healthy/clean	1	2	3	4	5
13. This person (seemed / did not seem) like they had slept around a lot	1	2	3	4	5
14. I felt I (knew / did not know) this person's sexual history	1	2	3	4	5
15. This person ("said" / did not say) they thought they were safe	1	2	3	4	5
16. This person (was / was not) someone I considered myself serious about	1	2	3	4	5

5. Please place an X on the line below to indicate what you think your chances are of getting a sexually transmitted infection (including HIV) within the next year, if you don't use a condom.

6. Please list the Sexually Transmitted Infections that you think you may be at risk for

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

SECTION

3

Sexual Decision Making

In this next section, we are interested in finding out about how often you use condoms for the purpose of protecting yourself from getting an STI or HIV.

7. Please place an X on the line below to indicate what percentage of the time (on average) in the last 6 months (considering all partners in the last 6 months) you used condoms for STI/HIV prevention?

8. Thinking only of the times in the last 6 months when you did not use a condom, please indicate by circling the numbers (using the 1 to 5 scale), how often each of the factors below influenced your decision to not use a condom.

	1 Never	2 Rarely	3 Sometimes	4 Very Often	5 Always
1. Alcohol	1	2	3	4	5
2. Drugs	1	2	3	4	5
3. Heat of the moment	1	2	3	4	5
4. No condom was available	1	2	3	4	5
5. Partner did not want to use a condom	1	2	3	4	5

☐ Does not apply, I always use a condom

☐ Other, please specify _____

9. Think about the same **SEXUAL PARTNER** as in questions 3 and 4 and indicate whether you *used a condom* for STI prevention the first time you had sexual intercourse with this partner. If you have only had sexual intercourse with this partner once, please indicate your condom use for that time.

- ☐ Yes, I used a condom for STI prevention the first time I had sex with this partner
- ☐ No, I did not use a condom for STI prevention the first time I had sex with this partner

If **NO**, please indicate by circling the numbers (using the 1 to 5 scale), how much influence each of the factors below had on your decision to not use a condom with this partner.

	1 No Influence	2 Slight Influence	3 Some Influence	4 Moderate Influence	5 Strong Influence
1. Alcohol	1	2	3	4	5
2. Drugs	1	2	3	4	5
3. Heat of the moment	1	2	3	4	5
4. No condom was available	1	2	3	4	5
5. Partner did not want to use a condom	1	2	3	4	5

- ☐ Other, please specify _____

10. If you are in an ongoing relationship with the same sexual partner as above, please indicate whether you used a condom for STI prevention the last time you had sexual intercourse with this partner.

- ☐ Yes, I used a condom for STI prevention the last time I had sex with this partner
- ☐ No, I did not use a condom for STI prevention the last time I had sex with this partner
- ☐ Does not apply, I am not in a relationship with this person

11. Thinking again about the same sexual partner as above, place an X on the line below to indicate what percentage of the time (on average) you have used a condom for STI/HIV prevention with this partner.

- ☐ Does not apply, I am not in a relationship with this person

SECTION

4

Sexual Decision Making

This section asks some questions about your background. Remember all your answers will remain anonymous and not linked back to you in any way. Please answer all questions.

12. What is your age in years? _____

13. What is your gender? _____

☐ 1. Male

☐ 2. Female

☐ 3. Transgender

14. What is your ethnic/cultural background?

Please specify: _____

e.g. Aboriginal/First Nation, White/Caucasian, Hispanic, Black, Asian (China, Japan, Korea), South Asian (India, Pakistan), South East Asian (Philippines, Indonesia, Thailand), Western Asian (Armenia, Iran), Middle Eastern (Israel, Saudi Arabia, Iraq), European, Canadian

15. What is your CURRENT Marital Status? (Please check ONE)

☐ 1. Single

☐ 2. Common Law

☐ 3. Married

☐ 4. Separated

☐ 5. Divorced

☐ 6. Widowed

16. What is your best estimate of your total household income in the past 12 months before taxes and deductions? (Please check ONE)

☐ 1. Under \$ 9,999

☐ 4. \$50,000 to \$79,999

☐ 2. \$10,000 to \$29,999

☐ 5. \$80,000 or more

☐ 3. \$30,000 to \$49,999

17. What is the highest grade/level of school that you have completed? (Please check ONE)

☐ 1. Grade 9 or less

☐ 5. Completed trade school

☐ 2. Less than high school graduation

☐ 6. Some college/university

☐ 3. High school graduation

☐ 7. Completed college/university

☐ 4. Some trade school

☐ 8. Other (please describe)

SECTION

4

Sexual Decision Making

18. How often in the last SIX MONTHS did you get drunk on alcohol?
(Please check ONE)

☐ 1. Never	☐ 5. Several times a month
☐ 2. Once	☐ 6. Once or twice a week
☐ 3. Every few months	☐ 7. Several times a week
☐ 4. Once or twice a month	☐ 8. Every day

19. How often in the last SIX MONTHS did you get high on drugs? (Please check ONE)

☐ 1. Never	☐ 5. Several times a month
☐ 2. Once	☐ 6. Once or twice a week
☐ 3. Every few months	☐ 7. Several times a week
☐ 4. Once or twice a month	☐ 8. Every day

20. What is your sexual orientation?

☐ 1. Heterosexual	☐ 4. Bisexual
☐ 2. Homosexual	☐ 5. Don't know
☐ 3. Lesbian	☐ 6. Other, please specify _____

21. What is your current relationship status? (Please check ONE)

- ☐ 1. Not in a committed relationship; having sex with one partner
- ☐ 2. Not in a committed relationship; having sex with more than one partner
- ☐ 3. In a committed relationship; only having sex with my partner
- ☐ 4. In a committed relationship; having sex with my partner and also having sex with one or more other partners
- ☐ 5. In a committed relationship; not having sex with my partner and having sex with one or more other partners
- ☐ 6. Other, please specify _____

22. How old were you when you had sexual intercourse (penis in vagina or penis in rectum) for the first time?

23. How many different people have you had sex with in your lifetime?

Please specify a number: _____

Or, if you cannot remember, please choose one of the options below.

☐ 1 partner	☐ 17 - 21 partners
☐ 2 - 4 partners	☐ 22 - 39 partners
☐ 5 - 8 partners	☐ 40 - 100 partners
☐ 9 - 12 partners	☐ 100 or more
☐ 13 - 16 partners	

24. How many different people have you had sex with in the last 6 months?

Please specify a number: _____

Or, if you cannot remember, please choose one of the options below.

☐ No partners in the last 6 months	☐ 13 - 16 partners
☐ 1 partner	☐ 17 - 21 partners
☐ 2 - 4 partners	☐ 22 - 39 partners
☐ 5 - 8 partners	☐ 40 - 100 partners
☐ 9 - 12 partners	☐ 100 or more

SECTION

4

Sexual Decision Making

25. Which, if any, of the following infections have you EVER been told (by a health care professional) that you have had?

☐ 1. Chlamydia	☐ 6. Hepatitis B
☐ 2. Gonorrhea	☐ 7. Trichomonas
☐ 3. Syphilis	☐ 8. NGU (Nongonoccal Urethritis)
☐ 4. Genital Warts	☐ 9. If female, pelvic inflammatory disease
☐ 5. Genital Herpes	☐ 10. None of the above

If YES to Genital Herpes or Genital Warts, please place an X on the line below to estimate how often (on average) you have used a condom in the past to protect your sexual partner from warts or herpes?

26. What was the reason for your clinic visit today? (e.g. STD testing, HIV testing, STD & HIV testing, Symptoms, Information etc.)

This is the end of the questionnaire. Thank you so much for your help in this study. Before you hand in this questionnaire, please make sure you have answered all the questions.

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