

**THE IMPACT OF AN UNDERGRADUATE HIV/AIDS EDUCATION COURSE
ON STUDENTS' AIDS KNOWLEDGE, ATTITUDES, AND
SEXUAL RISK BEHAVIOUR**

by

Cheryl M. Fraser

B.Sc. (Honours), University of Victoria, 1985

M.A., Simon Fraser University, 1993

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APPROVAL

NAME: Cheryl M. Fraser

DEGREE: Doctor of Philosophy (Psychology)

TITLE: The impact of an undergraduate HIV/AIDS education course on students' AIDS knowledge, attitudes, and sexual risk behaviour

EXAMINING COMMITTEE: Chair: James Marcia
Professor

Robert Ley
Associate Professor
Senior Supervisor

Stephen Hart
Associate Professor

Bruce Alexander
Professor

David Cox
Associate Professor
Internal External Examiner

Jeffrey Kelly
External Examiner
Professor of Psychiatry and Mental Health
Sciences
Director, Center for AIDS Intervention
Research
Medical College of Wisconsin

Date Approved: 10 July 1996

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The Impact of an Undergraduate HIV/AIDS Education Course on

Students' AIDS Knowledge, Attitudes, and Sexual Risk Behaviour

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ABSTRACT

Many heterosexual North American adolescents and young adults are engaging in sexual behaviour that puts them at risk for human immunodeficiency virus (HIV) infection and subsequent fatal illnesses associated with acquired immunodeficiency syndrome (AIDS). Outcome studies indicate that while HIV/AIDS education programs are generally successful at increasing knowledge, they rarely lead to the sexual behaviour change that is necessary for protection from HIV. One promising method for changing this behaviour is to change attitudes of perceived personal invulnerability to HIV. The current research assessed the effectiveness of an undergraduate HIV/AIDS education course that focused on attitude change. The course comprised lectures, small group discussions, and a question and answer session with a panel of five HIV positive men and women. Intervention group ($N = 388$) and control group ($N = 175$) students completed the AIDS Risk Knowledge Test, AIDS Attitude Scale, and a Sexual Risk Behaviour survey during the first lecture of the course and its last lecture (four months later). Analyses of covariance indicated that immediately postintervention, students in the AIDS education group had significantly higher scores on the AIDS Risk Knowledge test and more tolerant attitudes toward HIV/AIDS sufferers than students in the control group. Students' subjective reports of a decrease in homophobia supported these findings. These positive changes were maintained at the eight month follow-up. There were no significant differences between groups on a composite score of sexual risk behaviour at postintervention, although AIDS education participants did report

more frequent condom use and intentions to practice safer sex in the future. The implications of the data for future HIV prevention programs for heterosexual youth are discussed.

DEDICATION

This dissertation is dedicated to C. Margaret Hanson, Evelyn Dean Fraser, and Linda Margaret Fraser. By your examples, I learned to conduct my life with compassion and integrity, and to aspire to grace. I also learned that I could do anything I wanted to do.

QUOTATIONS

"AIDS is, and will be for some time to come, the metaphor of our troubled age. Perhaps, even more so than the atomic bomb, the hellish inferno of Hiroshima and Nagasaki. You see, the atomic bomb, in all its horror, is about cruelty, death and dying. But AIDS, like syphilis, is a shadow that falls on life at its most tender moment when love consummates creation."

Krause, 1993, p. i.

"The pleasure principle long persists, however, as the method of working employed by the sexual instincts, which are so hard to 'educate', and, starting from those instincts, or in the ego itself, it often succeeds in overcoming the reality principle, to the detriment of the organism as a whole."

Freud, 1961, p. 10.

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CHAPTER 1: INTRODUCTION

A. Background

AIDS. These four letters represent one of the most emotionally charged "words" in the language of this decade. AIDS is wedded to other emotionally charged words such as sex, drugs, blood, and death. The present research focuses upon one aspect of what is arguably the most important health and social issue of our time: AIDS and HIV infection. This dissertation describes the implementation and evaluation of an AIDS education course designed to increase AIDS knowledge, create more tolerant attitudes toward AIDS and people with AIDS (PWAs), and decrease sexual risk behaviour in young heterosexual adults. Before describing a research project that can easily be considered without attention to "the bigger picture," it is important to place what follows in context by briefly reviewing some facts about AIDS.

Epidemiology

Acquired immune deficiency syndrome (AIDS) was first reported in the United States in 1981. Since then, AIDS has become the most serious transmissible disease epidemic of modern times. The World Health Organization predicts that by the year 2000, between 40 and 110 million people will be infected with the human immunodeficiency virus (HIV) (Kelly & Kalichman, 1995). In the United States, AIDS is now the second and sixth leading cause of death in men and women aged 18 to 44 (Kelly, Murphy, Sikkema & Kalichman, 1993). By 1989, the United States Centers for Disease

Control (CDC) had recorded 85,590 cases of AIDS (Glasner & Kaslow, 1990). A mere five years later there are now 400,000 people diagnosed with AIDS and over a million HIV infected persons (CDC, 1994). It has been predicted that one in every ten U.S. residents will be HIV positive in the next decade (House & Walker, 1993).

In Canada, the first recorded AIDS case was in 1982, and Health and Welfare Canada currently reports approximately 11,000 AIDS cases nationally, with an estimated 60,000 additional Canadians being infected with HIV (National AIDS Strategy, 1994). The rate of infection has been increasing, with an average between 2,500 and 5,000 new HIV infections per year over the last five years. The median age of infection has also been dropping steadily, from age 32 years in 1987 to age 23 years from 1985 to 1990 (deBerger, 1995/1996). In British Columbia, by the fall of 1994 there were 1,824 AIDS diagnoses, and 7,846 reactive HIV tests (B.C. Centre for Disease Control, 1994). These statistics may grossly underestimate the actual number of HIV positive persons in B.C., as they are based on only those people who have chosen to be tested. It is estimated that the actual number of HIV positive people in B.C. is between 10,000 and 30,000.

AIDS is believed to be caused by the human immunodeficiency virus, which is transmitted primarily by exposure to contaminated blood or by sexual intercourse with an infected person. HIV transmission during sexual activity requires that infected fluids (e.g., semen, vaginal fluid) gain access to the

uninfected partner's bloodstream, usually through contact with mucosal membranes during vaginal or anal intercourse. Transmission can also occur from mother to fetus or infant. There is no conclusive evidence that the virus is transmitted through saliva, tears, urine, or other body fluids (Lifson, 1988). In North America HIV was at first thought to be limited to "high risk groups" (homosexual men, intravenous drug users, haemophiliacs) who engaged in high risk activities (unprotected anal sex, needle sharing) or who received numerous blood transfusions. This was in fact the early pattern of transmission. However, the HIV/AIDS pandemic knows no boundaries; all people are at risk. In areas such as Africa and Haiti, heterosexual transmission is most common (Glasner & Kaslow, 1990), and heterosexual intercourse is the most common route of transmission worldwide (Krause, 1993).

Heterosexual Transmission of the HIV Virus

During this second decade of HIV infection, heterosexual transmission is increasing rapidly in North America. For example, teenage and young adult men and women have the fastest growing seroprevalence (HIV positivity) rate in B.C. (B.C. CDC, 1994). Yet the actual level of risk for transmission from heterosexual intercourse is difficult to determine, for the following reasons. First, there is no established relation between the absolute number of sexual contacts and the frequency of viral transmission. Second, factors such as the amount of virus in semen or the depletion of t-helper lymphocytes have been proposed to influence the chances of sexual transmission. This suggests

that HIV positive persons may be particularly infectious at some times and substantially less so at others (Krause, 1993). Third, male to female transmission seems to occur more readily than female to male, possibly due to the greater area of mucosal surface in the female genital tract. American prevalence studies of female partners of infected men indicate that 10 to 22% of the women became infected; in another study, only 8% of male partners of HIV positive women became infected. However, in Africa and other nations the transmission rates between the sexes are nearly equal (Glasner & Kaslow, 1990). In addition, multiple and unreported risk factors (sharing needles, high risk homosexual contacts, transfusions of unscreened blood) may result in misleading statistics, in either direction, for heterosexual transmission.

Due to the increased prevalence and threat of an even wider spread of the virus through this route, heterosexual HIV transmission has become a major concern for public health officials and AIDS educators in North America. Unfortunately, in part due to the early and graphic identification of the virus with homosexuals and intravenous drug users, heterosexuals often fail to perceive themselves at risk, and so they fail to protect themselves.

There is no cure for AIDS or vaccine against HIV at this time. Eighty percent or more of individuals who become infected with HIV eventually will die from AIDS or AIDS-related infections. The death is a horrible one; most patients experience severe wasting (weight loss), body sores, and dementia (Kelly & St. Lawrence, 1988). In this pandemic "an ounce of prevention is worth a pound of

cure." Safer sex practices, including the use of condoms or other latex barriers, and the adoption of sexual practices that do not allow fluid to membrane contact (e.g., mutual masturbation) substantially reduce the risk of HIV transmission. AIDS education for sexual behaviour change is our best defence against HIV transmission, and therefore against AIDS.

The Need for AIDS Education for Behaviour Change

Behaviour change is the only currently available means for the primary prevention of HIV infection. HIV is communicable, can be transmitted through relatively low rates of risk behaviour, and only highly effective, consistent and long term changes in risk behaviour can keep a person safe from infection. Many authors (e.g., Kelly et al., 1993) argue that officials have not responded appropriately to the unique and urgent demands of the HIV pandemic. "The global numbers of HIV-1 infection and AIDS would be less than half of what they are now if public-health-education efforts focusing on eliminating or modifying sexual and drug-injecting behaviours that place people at increased risk...had been rapidly and aggressively implemented from the early '80's" (Chin, 1993, p. 66).

Both the recent Canadian National AIDS Strategy (1993) and the United States National Commission on AIDS (1993) stressed the need to develop and implement theoretical models, interventions, and evaluations related to changing risky behavior. They also outlined the role of the social sciences in developing national programs for HIV prevention. The Canadian strategy

committed 203.5 million dollars to this aim over five years, and focused on prevention as its first priority. It stated that the goals should include promoting and sustaining healthy behaviour and creating a supportive social environment to help maintain behaviour change. The U.S. Commission also stated that primary prevention is first and foremost a behavioral problem, and pointed out that we currently have a far better understanding of what types of risk behaviours occur than we do of why they occur, and how to stop them. The call for efficient and theory driven research into behaviour change is clear.

Conclusions and Overview

It is apparent that HIV infection is a huge threat to public health, that heterosexual transmission is increasing in North America, and that the only way to limit the spread of HIV in this population is to implement interventions that lead to sexual behaviour change.

The current study focuses on AIDS education with one population whose heterosexual behaviour puts them at risk for HIV infection: university students. In the following sections of this chapter I will review the literature concerning the current level of AIDS knowledge, attitudes, and sexual risk behaviour in young heterosexuals; discuss some theories and models of behaviour change; examine various personal and social factors that are associated with risky sexual behaviour; look at how to design an effective intervention for changing attitudes and behaviour; and review various AIDS education evaluation studies that have been conducted with this population. I will then describe the current

intervention study.

B. Surveys of the AIDS Knowledge, Attitudes and Sexual Behaviour of Young Heterosexual Adults

Before I take up the question of how to design an intervention to change young heterosexuals' knowledge and attitudes about AIDS, and reduce their risky sexual behaviour, it is important to establish what the literature tells us about the baseline levels of these variables in this population.

AIDS Knowledge and the Relationship to HIV Risk Behaviour

As a background to a consideration of the AIDS knowledge of young heterosexuals, note that the increase in the level of AIDS knowledge in the American public from 1987 to 1992 is not reflected by a proportional increase in reported condom use. A review of 116 public opinion surveys carried out during this time period (Rogers, Singer & Imperio, 1993) shows steady gains in the understanding of HIV transmission, although a significant percentage (25 to 40%) of participants continued to have misconceptions about the risk of transmission through casual contact. As for sexual risk behaviour, significantly more survey participants reported condom use in later surveys, with 10 to 20% reporting condom use in the mid 1980s, and 20 to 30% by late 1991. However, even the reported increase from 19% to 26% of participants using condoms for the first time are not very encouraging; the trend may be in the right direction, but the small magnitude of change is alarming. At the end of the survey period, two out of five adults reported that they were fairly or very concerned about

AIDS as a personal health threat, yet few reported appropriate behaviour change. This finding is a consistent one.

One major survey of AIDS knowledge reported by Canadian adults has been conducted (Ornstein, 1989). The findings are similar to the American data, indicating that 90% of Canadian adults could define AIDS and knew how it was transmitted, although 25% had some misconceptions about transmission (e.g., that blood donors were at risk for infection). This overview indicates that the level of AIDS knowledge is high in the general North American population, regardless of demographic factors. So what appears to be the level of knowledge in the population of interest?

There have been many studies that have examined AIDS knowledge and AIDS risk in young heterosexuals. From both a public and a personal health standpoint, the results are alarming. Overall, this research indicates that adolescent and young adult heterosexual men and women have high levels of knowledge about AIDS and HIV transmission, with some proportion having misconceptions (e.g., about the risk of transmission through activities like kissing, donating blood or being stung by a mosquito) and yet this population continues to engage in sexual behaviour that puts them at risk. North American studies find similar results for high school students (DiClemente, Lanier, Horan & Lodico, 1991; Lamport & Andre, 1993), Canadian youth age 11 to 21 (King et al., 1989), sexually active adolescents attending a family planning clinic (McGill, Smith & Johnson, 1989), college students (Dilonio, Parsons, Lehr, Adame &

Carlone, 1993; Jacobs, 1993), young inner-city women (Osmond et al., 1993; Rikert, Jay, Gottlieb & Bridges, 1989), African-American and Hispanic youth (Ford & Norris, 1993; Thomas, Gilliam & Iwrey, 1989), and incarcerated male adolescents (DiClemente et al., 1991).

For example, in a recent study DiClemente, Brown, Beausdeil and Lodico (1993) surveyed urban and rural adolescents and found that both groups had high levels of AIDS knowledge, with some misconceptions (e.g., 25% of the rural subjects thought birth control pills could help to prevent HIV). These misconceptions existed even though between 61% and 80% of the subjects reported having attended AIDS education classes at school. On a more disturbing note, the adolescents were engaging in behaviour that carries HIV transmission risk, with rural adolescents twice as likely to engage in sexual risk behaviour than their urban counterparts. These authors propose that rural teens do not perceive the personal salience of the threat of HIV infection, and so do not take steps to protect themselves (see the following section). In summary, DiClemente et al. state "the findings highlight the weak relationship between knowledge of HIV and the adoption and/or maintenance of preventive behaviours during sexual intercourse (p.234)."

As for older youth, in a survey of 352 college students, Dilonio et al. (1993) found the same patterns. Knowledge was good, with 90% of the sample having an accurate understanding of HIV transmission, yet this knowledge was not a determinant of sexual behaviour, nor did it influence the students'

perceived personal susceptibility to infection.

On a more hopeful note, one study did find a weak correlation between AIDS knowledge and sexual responsibility in high school and college adolescents. However the relationship was strongest for women, and the authors point out that the findings might be influenced by the low reliabilities for the instruments they used (Lamport & Andre, 1993).

This brief review clearly indicates that although young heterosexuals, both adolescents and young adults, have a high level of AIDS knowledge, this knowledge does not seem to influence their own sexual risk behaviour.

Attitudes and Beliefs about AIDS and HIV

A growing body of literature indicates that attitudes toward AIDS, people with AIDS (PWAs), homosexuality, and similar issues are related to and may influence AIDS knowledge, beliefs about personal susceptibility to HIV infection, and even actual sexual risk behaviour. These findings have implications for AIDS education and the design of interventions, as we will see in a later section.

AIDS is a disease that has prompted moral judgements, with the consequence that HIV infection is often seen as self-inflicted, and/or associated with "deviant" lifestyles. This negative judgement can lead to the belief that victims of HIV are not deserving of sympathy. Victim-blaming and support for restrictive measures that may violate individual rights have, tragically, been associated with HIV and AIDS in a manner that is not seen with other terminal illnesses. For example, reviews of research and public opinion surveys (Peruga

& Celentano, 1993; Rogers et al., 1993) indicate that homophobia strongly predicts support for the restriction of the rights of PWAs; that individuals self-defined as holding right-centred political ideas are more likely to have low AIDS knowledge and higher rejection of PWAs; that 34% of survey participants in 1991 believed that AIDS might be a punishment for a decline in moral standards; and that while 80% of respondents reported having "some" or "a lot" of sympathy for PWAs, this percentage dropped to 39% if the PWA was said to be infected through homosexual contact. In a random dialing telephone survey, Herek and Capitanio (1993) found that 30% of English speaking adults reported negative attitudes and feelings of disgust toward PWAs, and one-half the respondents stated that they would avoid a corner store if the owner had AIDS. Only 16 to 22% of respondents did not give any type of stigmatizing response. The authors concluded that AIDS-related stigma is still a serious problem in the United States.

Ornstein (1989) found that adult Canadians strongly supported the rights of PWAs, but that 80% did believe that physicians should have the right to demand an HIV test, and 86% felt an infected person should be required to disclose their sexual contacts. The only major survey of Canadian youth (King et al., 1989) found that attitudes became less tolerant as the potential for contact increased, that 13 to 24% of students thought PWAs should be quarantined, and that 38-45% thought that homosexuality was wrong.

As for the population of interest in the current research, many authors

have explored AIDS-related attitudes in young heterosexuals. Usually they have found that the homosexual stigma associated with AIDS may inhibit the discussion and practice of safer sex, since the risk is not personalized and many adolescents and college students see AIDS as a "gay disease" that cannot affect them (e.g, DiClemente, et al., 1993; Ross & Rosser, 1989). For example, Westerman and Davidson (1993) surveyed 80 heterosexual adolescents, and found that those who were highly prejudiced against homosexuals were five times more willing to engage in indiscriminant sexual activity and twice as willing to have sex without condoms than those who were less prejudiced. The authors concluded that "ignorance in one area (attitudes towards gays) thus diminishes the use of knowledge in other areas (e.g., "safe" sex practices as an anti-AIDS strategy) (p.212)." Both homophobia and intolerant attitudes toward AIDS tend to be higher for male adolescents than females (King et al., 1989; Shrum, Turner & Bruce, 1989; Young, Gallaher, Marriott & Kelly, 1993).

An interesting study that looked at the beliefs about susceptibility to AIDS in a group of 18 to 25 year olds found a denial of one's own risk of contracting HIV. The participants rated risk for a generalized other (a person who has sex with many different partners without a condom), a hypothetical self (themselves if they were to have sex with many different partners without a condom), and their actual self. Respondents whose actual behaviour was rated high risk had a significant denial of their own risk of contracting the virus; they rated their own

chances as one in a million, yet rated a generalized other with similar risk behaviour to their own as 1/150 for women and 1/900 for men (Hansen, Hahn & Wolkenstein, 1990). Both sexes rate personal risk for HIV infection lower than for hypothetical others, especially if the other is not perceived as similar to themselves (Mickler, 1993). This supports the argument that homophobia and other negative attitudes toward HIV may directly influence the lack of personalization of risk, and therefore have an impact on participation in risky sexual behaviour.

The problem seems to be that young heterosexuals see AIDS as a disease of the "other," as an outgroup problem, and so do not personalize the threat of HIV infection to the "self;" hence they maintain an illusion of invulnerability. In this way young heterosexuals may continue to perceive themselves as not at risk. In a later section I will review findings which suggest that changing these erroneous attitudes and beliefs is a crucial step toward creating sexual behaviour change.

The Sexual Behaviour of Young Heterosexuals

North American adolescents and young adults are having sex. This statement probably is not surprising to most; but what may be surprising is the amount of sexual activity for this group, and the possibility that this behaviour may lead to widespread HIV infection in this population over the next decade. Unprotected vaginal intercourse is the primary route of HIV transmission in young heterosexuals. While teenagers make up fewer than 1% of AIDS cases to

date, it is believed approximately 100,000 teens in the U.S. may be currently infected with HIV; the number of adolescents with AIDS diagnoses doubles yearly (Stevenson and Davis, 1994); and 20% of new cases reported to the CDC are in their twenties, which means they were likely infected with HIV in their teens or early twenties (House & Walker, 1993). In Canada, 19% of AIDS cases in the country, 15% of AIDS cases in B.C., and 27% of reactive HIV tests in B.C. are for people below the age of 30 (B.C. CDC, 1994; National AIDS Strategy, 1994).

Seidman and O'Reider (1994) reviewed surveys of sexual behaviour in the United States, and they found that sexual activity among adolescents has increased dramatically over the last 20 years, with the majority of young adults aged 18 to 24 now being sexually active. This sexual activity is typified by multiple, serial sexual partners and inconsistent condom use. The average age of first intercourse for males is 16 or 17, and for females a year later. Between the ages of 25 to 29, monogamy is the norm, with 80 to 90% reporting having only one partner in the previous year. The Canadian Youth and AIDS study (King et al., 1989) reported that 50% of 16 year old and 75% of older adolescents had experienced sexual intercourse, 45 to 57% of these worried about getting HIV, but that less than 15% reported that the fear of AIDS prevented them from having sex.

Given that anyone who has had unprotected sex with any person since 1979 may be at risk for HIV infection, all young heterosexuals who are not in a

long term strictly monogamous relationship where both partners have no other risk behaviour should be practicing safer sex. Unfortunately, this is not the case. Researchers report that adolescent contraceptive use is low (Wattleton, 1987), with only 17% of low SES female adolescents buying or using a condom (Rikert et al., 1989) and only 6% of girls and 8% of boys citing prevention of HIV/AIDS as the most important reason for using condoms (St. Lawrence, 1993). The CDC and Prevention Youth Risk Behaviour Survey (CDC, 1992), drawing upon a representative sample of students in grades 9 to 12 in the United States, found that between 28 and 53% of high school students reported some condom use.

As for college students, in a mail survey Baldwin and Baldwin (1988) found that students were engaging in few activities that would protect them from contracting HIV. Seventy percent thought their own risk of contracting AIDS was unlikely or very unlikely, and 66% had never used condoms in the past three months. Only 13% always used condoms. Hernandez and Smith (1990) found that only 25% of the college students they surveyed had used a condom in the past 23 weeks. These researchers found that the students had inaccurate perceptions of the safety of monogamous relationships, given that the pattern was for short term, serial monogamy. This meant sexual transmission of HIV from a short term partner, who had several previous partners, was still a risk, even if the current relationship was exclusive. Support for this point is provided in an interesting study of dishonesty in college dating, where it was found that

although 72% of the sample defined themselves as being in a monogamous relationship, 36% of the males and 21% of the females had been sexually involved with another person concurrent to the "monogamous" relationship. In addition, three-quarters of the males and one-third of the females stated that they had never asked about their partners' past sexual history (Stebbleton & Rothenberger, 1993). Canadian university students also fail to use condoms regularly, with only 14% always using condoms and 25% never using them. Although 47 to 65% of the students surveyed had three or more sexual partners, 45% thought of their current relationship as long term and permanent, and so seemingly felt safe from HIV (King et al., 1989).

These research findings point to some disturbing conclusions. First, adolescent and young adult heterosexuals have high rates of unprotected intercourse with multiple partners, and consequently, they are at risk for HIV infection. Second, many university students define themselves as being in a monogamous relationship, and use the reasoning that they have only one current sexual partner to justify not using condoms. However, serial monogamy, sexual infidelity and a lack of knowledge about the partners' past sexual relationships imply that these seemingly low-risk sexual relationships may in fact carry the threat of HIV infection.

Conclusions

This review indicates that despite widespread information that leads to a high level of AIDS knowledge in young heterosexuals, a large proportion of this

group still engages in sexual risk behaviours with an alarming frequency. They know how to minimize their risk, and yet still participate in unprotected sex and feel invulnerable to HIV and AIDS. Their attitudes and beliefs suggest that they tend to see HIV as a problem of the other, and so consistently underestimate their own level of risk. So what can be done to prevent the further spread of HIV within this population? The urgent need for comprehensive and effective AIDS education interventions that target attitude change and the personalization of risk as well as sexual risk reduction is clear.

C. How Can Attitudes and Behaviour be Changed?

A challenge facing social and health scientists in general, and AIDS educators in particular, is to design health education programs that will lead to changes in problem behaviour. The resistance of patterns of behaviour and lifestyle to intervention efforts has been well documented; weight loss and "quit smoking" campaigns are two examples of programs that have low therapeutic compliance (e.g., Prochaska & DiClemente, 1992). How does one design effective interventions? First, it is important to consider that behavioural responses to health threats are affected not only by scientific information, but also by attitudes; and that cognitive processes will affect the decisions made regarding personal risk and the need for behaviour change. The relationships between knowledge, attitudes, decision making, and health behaviour, and the impact of these relationships on the process of education, have been explored in many models, several of which are most applicable to AIDS education and to

the current research. A brief review of three of these models follows.

Models of Health Behaviour Change

i) The Theory of Reasoned Action (TRA). TRA focuses on the attitude-behaviour relationship, and maintains that intentions are the best predictors of behaviour. These intentions are based on both personal and social influences; the individual's positive or negative attitudes regarding the behaviour in question and their perception of the social pressure to perform the behaviour (Chan & Fishbein, 1993; Ross & Rosser, 1989). In terms of HIV risk behaviour, attitudes that might influence the intention to use condoms include the belief that safer sex is less satisfying, the belief that performing the behaviour will lead to a desired outcome (i.e., less risk for HIV infection), the evaluation of social support for condom use, and the personal importance of social or subgroup norms (Chan & Fishbein, 1993; Zimmerman & Olson, 1994). Proponents of the TRA model explain their view that personal attitudes and social norms are functions of underlying cognitive belief structures, and that we must change these underlying structures in order to change the behaviour. They attempt to define a general theory of human behaviour that focuses on the relationships between beliefs, attitudes, intentions and behaviours, and propose ways to operationally define these variables and assess them in a standardized manner (Fishbein, Middlestadt & Hitchcock, 1994).

There is some empirical support for the usefulness of the TRA model for understanding HIV risk behaviour, indicating that attitudes about risk reduction

behaviours and perception of norms do predict college women's intentions to tell their partners to use condoms (Chan & Fishbein, 1993), the current and predicted risk behaviours of heterosexual university students (Zimmerman & Olson, 1994), and the intentions of homosexual men to engage in various sexual behaviours (Fishbein et al., 1993). However, the TRA assumes that behaviour is under cognitive control, and that people can carry out their behavioural intentions. This is a strong assumption, and does not take into consideration the ease or difficulty of carrying out the intended behaviour, or the role that the other person can play. Nor does this model include the role of information, skills, and other determinants of behaviour (Fisher, Fisher, Williams & Malloy, 1994).

ii) The Health Belief Model (HBM). HBM also focuses on the intention to act. This widely used model tries to predict preventive health behaviour by focusing on the importance of the individual's perception of their susceptibility to illness, the severity of the consequences of the illness, and their evaluation of the costs and benefits associated with preventive actions. In this way, behaviour is seen as a function of the subjective value placed on an outcome and the expectation that the behaviour will lead to that desired outcome (value-expectancy theory). This model also suggests that a "cue to action," either internal or external, must occur in order to prompt a person into preventive action (Rosenstock, Strecher & Becker, 1994; Ross & Rosser, 1989; Zimmerman & Olson, 1994). There is inconsistent empirical support for this

model (Fisher et al., 1994). For example, one study of urban women did show support for this model with respect to protective sexual behaviours, with women reporting during interviews that they perceived themselves to be moderately susceptible to HIV, were well aware of the severity of HIV illness, and did not think that protective behaviours were overly burdensome (Geilen, Faden, O'Campo, Kass & Anderson, 1994). However, this sample consisted of pregnant women, and it is unclear whether these results generalize.

A study by Yep (1993) with sexually active undergraduate subjects found that perceived susceptibility to HIV infection was a significant predictor of monogamy, and that perceived barriers, or the cost associated with changing behaviour was the most significant predictor of behaviour. Perceived cost was inversely related to monogamy and safer sex. Conversely, Zimmerman and Olson (1994) point out that the perceived threat of illness is often the least consistent predictor of actual behaviour change, and that high fear is often related to inaction.

The main shortcoming of this model is that the mechanisms by which the various constructs operate has not been adequately addressed. Rosenstock et al. (1994) suggest that research needs to look at the various health beliefs in interaction, not separately or sequentially. They also argue that personal susceptibility may be a key variable, since people with low susceptibility may be less likely to change their behaviour. In addition, the HBM contains no specific suggestions for how to plan or implement behaviour change.

iii) Bandura's Social Learning Theory (SLT). SLT attempts to address some of these points. SLT emphasizes the role of perceived self-efficacy in controlling HIV risk behaviour (Bandura, 1990, 1994; Keller, 1993; Stevens-Smith & Remley, 1994). It is postulated that in order to change behaviour, people need not only the knowledge of how they can change, but the necessary skills and resources and the confident belief that they can use them under difficult circumstances. The influence of cognitive, emotional, situational and social factors on behaviour are emphasized. Based on this theory, there are four major recommended components for effective HIV risk behaviour change interventions.

The first component is the provision of information to increase awareness and knowledge of general and personal HIV transmission risk and how to alter personal health habits. The second step is to provide the social and self-regulatory skills necessary to translate concern into preventive action, through social modelling. Third, skills must be rehearsed and enhanced through guided role plays, corrective feedback, discussions, and other means. Finally, social support for the new behaviour must be provided in order that the targeted personal changes be desirable in reference to the subgroup and community norms. I would summarize the process for the individual as 1) "I need to do this" 2) "I know how to do this" 3) "I really can do this" and 4) "My friends and community believe I should do this."

The SLT model of intervention has been used successfully to create

behaviour change in gay men, inner city women, and heterosexual university students (e.g., Fisher et al., 1994; Kelly, St. Lawrence, Hood, & Brasfield, 1989b). The belief in personal efficacy to have control over one's sexual behaviour has been found to be the best predictor of sexual risk-taking in various populations (Bandura, 1994) and specifically to be related to the intention of male adolescents to use condoms (Jemmott & Jemmott, 1994). The importance of social support not only for the creation but for the maintenance of new behaviours has been illustrated (Kelly & St. Lawrence, 1990) and the influence of situational factors (e.g., the use of alcohol before sexual activity; spontaneous, unplanned intercourse) on sexual risk behaviour have also been demonstrated (Keller, 1993; Kelly, St. Lawrence, & Brasfield, 1991). Overall this model receives theoretical and empirical support for the triadic reciprocal causation of human behaviour, consisting of personal determinants, behaviour, and environmental influences.

Summary

Most of the models that have been used to conceptualize HIV sexual risk behaviour include the three main areas described here. For example, Fisher et al. (1994) develop their information-motivation-behaviour skills model, which emphasizes that all three areas must be targeted in AIDS education interventions in order to change behaviour. Although the models emphasize different attitudes and beliefs (i.e., concern regarding illness versus the influence of significant peers versus self-efficacy), the point they seem to

agree upon is that behaviour change will not happen until certain attitudes that underlie the motivation for behaviour are changed. In summary, the constructs appear to be linked, in that information and motivation are expressed in behaviour skills to effect preventive behaviours.

Another way of exploring the question that opened this section, namely "how can attitudes and behaviour be changed?," is by examining various personal and social factors that have been found to influence these variables in young adults. An examination of important intervening variables should inform the design of AIDS education programs. A brief review of some factors that have both theoretical and empirical support for their relationship with either initial attitudes and behaviour or changes in attitudes and behaviour follows.

Factors Associated with Sexual Risk Behaviour

There are many variables that appear to be related to the sexual risk behaviour of young heterosexuals, likely through the decision making mechanisms proposed in the models for behaviour change reviewed earlier. The variables are numerous, and include individual as well as societal and community factors (Aggleton, O'Reilly, Slutkin & Davies, 1994; Thornton & Catalan, 1993).

i) Attitudes toward condoms. Research on condom use in young heterosexual samples indicates that negative attitudes toward condoms can present a significant barrier to the adoption of safer behaviour. Specifically, factors including self and partner objections, the belief that one is not at risk for

HIV infection, embarrassment, concern regarding the loss of sensual pleasure, seeing condoms as unattractive or offensive, and concern about negative social reactions to carrying condoms are all associated with less condom use (Hobfoll, Jackson, Lavin, Britton & Shepherd, 1993, 1994; Sheeran, Abraham, Abrams, Spears & Marks, 1990; Wilson, Jaccard, Endias & Minkoff, 1993). Females tend to have more favourable attitudes toward using condoms and higher self-control ratings that predict actual condom use, but greater inhibitions about buying and carrying condoms than males (Norris & Ford, 1994; Sacco, Rickman, Thompson, Levine & Reed, 1993). The male partner appears to have a greater influence over condom use (Yep, 1993). Positive correlates of condom use include sexual communication and the sexual enjoyment value of condoms (Catania et al., 1992, 1994; Lagana & Hayes, 1993).

These findings indicate that it is imperative that AIDS education interventions focus on improving sexual communication skills, eroticizing condoms and enhancing the sexual pleasure associated with condom use, and decreasing the barriers that interfere with purchasing, possessing and using condoms. The use of explicit information is encouraged. (See the section under designing effective AIDS education that describes relevant research.)

ii) Developmental factors. Many authors have suggested that adolescents and young adults have some developmentally specific risk factors that are relevant to their level of HIV sexual risk behaviour (e.g., House & Walker, 1993;

Kelly et al., 1993; Levine et al., 1993). Adolescence is a time when the sexual self-concept is developing. Sexual inexperience, fear of rejection, low personal efficacy appraisals, and insecurity may all influence sexual activity and condom use. This group may have incomplete knowledge of contraception, inexperience with negotiating sexual activity and condom use with a sexual partner, and poor sexual communication skills. In addition, this is often a time of experimentation and risk taking, and so young people may have multiple unsafe sexual contacts. As is mentioned previously, this group may be particularly susceptible to perceiving themselves as immortal, and maintain an illusion of invulnerability--"it will never happen to me" (Hunter & Schaecher, 1994)--which, combined with their identification of HIV as a problem of "the other," will decrease the likelihood that they will practice safer sex. Finally, adolescents and young adults may have a concrete, short-term world view that interferes with decisions related to possible future harm or illness.

Peer influences and social context are very important determinants of sexual behaviour in young heterosexuals. Courtship, mate selection, and other heterosexual skills fluctuate with societal changes (Nangle & Hansen, 1993). Social trends may support the positive aspects of monogamy and negative concepts regarding the meaning of condom use; that it is not romantic or fun to use condoms, or that condom use implies promiscuity (Yep, 1993). On a practical note, concern over pregnancy and the common use of birth control pills may lead to less condom use (St. Lawrence, 1993).

Overall, sexual, emotional, and cognitive developmental factors will influence each step in the process of choosing safe (e.g., condom protected intercourse; sexual activities where fluids are not exchanged) or unsafe (e.g., unprotected intercourse) sexual behaviour, and carrying it out. AIDS education with young adults must target heterosexual skillsbuilding and challenge the illusion of invulnerability, helping youth both to personalize risk and to have the skills to negotiate safer behaviour.

iii) Cognitive factors. Cognitive distortions, including splitting, minimalization, rationalization, and denial, can have powerful effects on decisions regarding behaviour. According to O'Gorman and Bownes (1990), cognitive distortions are psychological mechanisms which allow a person to "rationalize, minimize or even totally deny the existence of some factor or information that is unpleasant to the psyche, even when confronted with evidence to the contrary" (p.263). These authors make the point that this process of distortion may allow sexually active people to justify high-risk activity and continue risk behaviour with psychological impunity. Their interviews of fifty male heterosexual subjects who attended an STD clinic in Ireland support this contention, and the authors state that cognitive distortion appeared to allow these subjects to believe that after reading AIDS information, protection would occur automatically.

Cognitive distortions and decision making biases have been shown to exert powerful effects on behaviour, and so they intervene between AIDS

education and actual behaviour change. Decisions are usually reached through a reasoning process, and that reasoning process is inherently biased. For example, judgements made under conditions of pressure or uncertainty are more likely to contain reasoning errors, and this can influence sexual risk behaviour (Kaplan & Shayne, 1993). Incomplete schemas or representations for HIV or safer sexual behaviour can lead to faulty decision making and higher risk behaviour (Keller, 1993).

On the whole, people tend to have unrealistically positive views of the self, their sense of personal control, and the future. This aptly named "optimistic bias" has been demonstrated in evaluations of personal risk for HIV infection in samples of heterosexual and homosexual adults (van der Velde, van der Plicht & Hooykaas, 1994). This optimistic bias is seen in other types of unhealthy behaviour, such as smoking or over-eating, where despite overwhelming evidence to the contrary people believe they are not putting themselves at risk. Mickler (1993) states "A...potential barrier to accurate perceptions of vulnerability to AIDS is a phenomenon called the illusion of unique invulnerability. This is a self-serving bias that affects peoples' assessment of the probability of negative events occurring to them" (p.45).

This brief presentation indicates that it is important for AIDS education interventions to target cognitive distortions and misperceptions, and help participants develop a less biased decision making strategy.

iv) Personality and demographic factors. It has been repeatedly shown that high levels of AIDS knowledge exist across populations. In an excellent review of 80 studies conducted with convenience samples of adolescents, students, and the general population in the Western world, Peruga and Celentano (1993) looked at correlates of AIDS knowledge. Overall, the research indicated that being highly educated, young, and white all increased the chances that AIDS knowledge was high. However, the authors point out that the level of knowledge was high even for poorly educated participants. There was no clear evidence of a gender difference, and other social and demographic factors did not appear to be related to AIDS knowledge. Yet knowledge has not been found to influence actual sexual behaviour. Are there other personality or demographic factors that do relate to sexual behaviour?

Risky sexual behaviour has been related to low levels of education and social economic status (Thornton & Catalan, 1993), external locus of control (Kelly et al., 1990), a passive coping style (Martin, 1993), low social conformity and participation in other risky behaviours (Stein, Newcomb & Bentler, 1994; Wilson et al., 1993). Factors associated with successful risk reduction behaviours (e.g., condom use) include self efficacy, a sense of self control, and the appraisal of a health threat to self or partner (Kelly et al., 1990; Martin, 1993). Therefore, AIDS education must include interventions to improve self efficacy, and emphasize the risk to self, once again by breaking down the self versus other barrier and helping participants to personalize HIV risk.

v) Social and situational factors. Many researchers have demonstrated the influence of peers, subgroup norms, and social support on the adoption and maintenance of safer sexual behaviour. For example, Kelly et al. (1990) found that gay men who did not participate in risky sexual activity were more likely to consider safer sex as an accepted norm within their peer group. Langer, Zimmerman, Warheit & Duncan (1993) compared high school students who reported self directed decision making styles with students who described themselves as peer directed, and found that those youth who were more strongly influenced by the views of their peers had higher risk attitudes and behaviour. Wilson et al. (1993) reported that young heterosexual women were less likely to carry condoms if they perceived this activity to be related to negative social attitudes.

Situational factors, particularly the use of drugs or alcohol prior to sexual encounters and perceived pressure to engage in risky activities, have also been related to risky sexual behaviour (e.g., Kelly et al., 1993; Kelly, Kalichman, et al., 1991; Ross & Rosser, 1989).

These findings suggest the importance of incorporating peer group support into AIDS education interventions, and of attempting to challenge and improve negative societal attitudes and judgements toward condom use. Rehearsal of behavioural skills for risk reduction in scenarios where situational or social pressure for unsafe behaviour is high are also indicated.

Conclusions and Implications

Changing sexual behaviour is very difficult. For example, in order to consistently use condoms, a person must make the choice to sacrifice an immediately rewarding, pleasurable activity in order to avoid a possible negative future consequence. Even if the decision to use a condom is made, sexual negotiation requires motivation and communication skills and is clearly affected by issues related to relationships, intimacy, self confidence, gratification, and power, to name a few. We often fail to mention another factor; one does not have control over the behaviour of one's partner. Further, safer sexual behaviour must be performed consistently and over the long term, and any lapses carry the potential for HIV risk. This brief paragraph covers only a portion of the many variables that have been suggested to influence sexual behaviour and risk reduction. Clearly this is one of the most complicated and multiply determined aspects of human behaviour, and AIDS education interventions cannot be expected to induce significant, permanent changes unless they too are complex and comprehensive.

Up to this point, I have attempted to illustrate that AIDS education interventions must target knowledge, attitudes and behaviour in order to fulfill the goal of HIV transmission prevention. This conclusion follows from the previous discussions of the illustration of the weak relationship between knowledge and sexual behaviour. As stated by Kelly and St. Lawrence (1990), knowledge alone is not enough to change behaviours which are "longstanding,

highly reinforced, socially coerced, and which carry negative illness consequences temporally distant from the immediately-reinforced activity which creates risk" (p. 13). In addition, the importance of attitudes and their impact on behaviour; the need to evaluate and accept personal risk and to then obtain the skills for behaviour change; the theoretical implications of various health behaviour models; and the individual, social and situational variables that have been related to sexual risk support this conclusion. So what are the implications of these many findings for designing effective programs in general, and particularly for the group of interest in the present study, young adults?

D. Designing Effective AIDS Education for Attitude and Behaviour Change

The research and theory to date identify the following goals for AIDS education interventions. First, there must be risk knowledge education, so that intervention participants understand HIV transmission and how to prevent it. Second, particularly for young heterosexuals, the beliefs and attitudes that prevent this group from personalizing HIV risk must be altered. Third, individuals who are at risk must be provided with the skills to implement changes in their behaviour. Finally, social support and subgroup norms which promote safer behaviour must be established.

Specific aspects of interventions that should help to reach these program goals include: training in safer sex practices including correct condom use and heterosexual skills for negotiating their use; practicing and reinforcing

these skills through rehearsal and role playing in a variety of simulated situations; presenting safer sex as a pleasurable, safer alternative to unprotected sex; promoting the erotic use of condoms; using small group discussions for reducing inhibitions about discussing, purchasing, and carrying condoms, eliciting social support for safer behaviours, and exploring attitudes and beliefs about HIV and AIDS; and allowing participants to meet with HIV positive persons in order to reduce stigma and personalize risk (Coates, 1990; DiClemente et al., 1993; Jacobs, 1987; Kaemingk & Bootzin, 1990; Keller, 1993; Levine et al., 1993; Manning, Balson, Barenberg & Moore, 1989; Nangle & Hansen, 1993; Sacco et al., 1993; Thornton & Catalan, 1993).

Overall there should be an emphasis on providing skills training (i.e., correct use of condoms, discussing condom use with a sexual partner), motivating young people to buy and use condoms, and decreasing the sense of personal invulnerability by using discussions, videos, and interactive exercises designed to increase the personal salience of the information. In summary, "behavior change efforts must now rapidly move to second generation approaches that incorporate methods to change social and peer norms concerning risk behaviour avoidance, facilitate acquisition of cognitive and behavioral skill competencies needed to implement and sustain change, foster accurate appraisals of risk vulnerability, strengthen behavior change motivation, and target situational factors - such as recreational drug use - that interfere with change implementation (Kelly et al., 1993. p.1024)."

Before moving on to a review of published evaluations of AIDS education interventions, I would like to elaborate on three aspects of AIDS intervention that I think are key components in creating attitude and behaviour change. They illustrate the creative application of theoretical and empirical findings to find real world solutions to the problem of sexual transmission of HIV.

Making Safer Sex Erotic

The only sure protection against the sexual transmission of HIV is abstinence. However, programs advocating abstinence, not surprisingly, tend to fail. AIDS education needs to promote condom use and safer sex as pleasurable activities. Attitudes toward condoms are usually negative; condoms are seen as offensive and unattractive to use (Sheeran et al., 1990) which is hardly surprising, given that they are usually presented in a negative way and associated with unwanted pregnancy and sexually transmitted diseases, including HIV. Condom use can be encouraged in young people by presenting condoms not as a necessary evil, but as an erotic tool that can be incorporated into foreplay and provide sensual pleasure for both partners.

There is some research that supports the effectiveness of this component of AIDS education in creating more positive attitudes toward condoms, which we have seen previously in this chapter is an important step toward their use. In a study by Tanner and Pollack (1988) with heterosexual couples, only those who received both condoms and verbal and written instructions on how to incorporate them into sensuous foreplay reported

enhanced attitudes toward condoms and increased pleasure associated with condom use. Couples who received condoms and no instructions showed no attitude change. It seems logical that a safer sex program that emphasizes the enhancement of sexual pleasure, rather than the restriction of sexual activities, will have greater success in creating long lasting behaviour change. D'Augelli & Kennedy (1989) found that university women preferred explicit safe sex brochures with photos and specific safer sex ideas over factual information alone. Coates (1990) also reported that an erotic program was more effective in increasing the adoption of safer sex. So explicit instruction for erotic condom use and safer sexual activities should be incorporated into AIDS education.

Intervening Through Peers

Another promising area of research has looked at the impact of peer norms on safer behaviour by intervening directly with key opinion leaders in samples of gay men (Kelly, St. Lawrence, Diaz, et al., 1991), college women (Kauth, Christoff, Sartor & Sharp, 1993), and black college students (McLean, 1994). These studies have demonstrated an increase in sexual HIV risk prevention behaviours following training of peer leaders to informally promote safer sex. Again, the importance of educating not just individuals, but subgroups and the larger society is indicated.

Introducing Participants to Persons With AIDS (PWAs)

Finally, a few intriguing studies have found that interventions that include some sort of exposure to persons with differing sexual orientations and/or

PWAs can change negative attitudes and increase tolerance. For example, Kalichman, Russel, Hunter and Sarwer (1993) sampled commuters in the two weeks following Earvin "Magic" Johnson's disclosure of his HIV positive status. They found that the perceived impact of this information was greatest for persons who had not previously known someone with HIV infection, in that somehow putting a human face on HIV had affected them. Pullium (1993) found that knowing real AIDS patients, even indirectly, greatly improved college students' willingness to help, liking, and empathy for a fictitious AIDS patient presented to them in a case study.

In an ingenious study, researchers showed college students a videotape of a white male graduate student with AIDS in which he discussed his life. The researchers then measured the degree to which students were willing to help him with a research project he was conducting, and which his illness was impeding. They measured degree of helping before the Magic Johnson announcement, and one week, two months and four months later. They found that the amount of help offered by both men and women increased significantly following the announcement, and that while none of the men offered to help prior to hearing that Johnson was HIV positive, 83% offered help immediately after. Women were found to be more likely to help in general. On a cautionary note; this study employed a very small sample size, the relationships were not maintained at follow-up, and although offers to help increased, subjects did not report changes in their feelings or beliefs about PWAs (Penner & Fritzsche,

1993).

Nonetheless, the implications of this study are interesting, namely, that identification with a personally influential agent may lead to changes in one's own behaviour (Bandura, 1994). Other researchers have indicated the importance of providing positive interactions with members of a target group (e.g., homosexuals) in order to reduce perceived differences (Haddock, Zanna & Esses, 1993). This finding supports the previously mentioned concept of self versus other, and stresses the importance of breaking down the barriers between AIDS education intervention participants and HIV infected persons in order to catalyze behaviour change.

A few studies have begun to look at this directly. Green, Dixon and Gold-Neil (1993) evaluated the impact of a gay and lesbian panel discussion on college students' attitudes toward homosexuals and PWAs. Undergraduates were measured two days prior to and immediately following the intervention. It was found that females had significantly more positive attitudes than males, and that the panel altered the attitudes of females in a positive direction, but not those of males. Students who had previous personal acquaintance with gay men and lesbians had more positive attitudes. Again, the importance of contact with the target population is emphasized, and this idea is supported by students' comments that they found it valuable to speak directly with panel members. Although the panel in this study did not include any PWAs, attitudes toward homosexuality and AIDS have been found to be strongly related.

However, for AIDS education interventions it would be most useful to have a panel including both homosexual and heterosexual HIV positive persons.

For example, contact with HIV positive and AIDS clients was found to be a significant covariate of attitudes in a sample of social workers (Shi et al., 1993). In another study, medical students who met an HIV positive physician for an hour-long discussion showed significant shifts toward more positive attitudes and beliefs about HIV, and changes in the direction of more empathic and positive professional attitudes toward treating HIV positive patients (Rundell, Ursano, & Sasaki, 1993). These changes were maintained four weeks following the intervention.

In summary, it appears that contact with PWAs can lead to more positive attitudes, which in turn may influence behaviour change. To date, no studies have used a panel of PWAs as part of their AIDS education intervention. The present study did. But before moving on to an examination of the present research, I would like to review studies in which other researchers have applied the findings and ideas presented here to AIDS education, and evaluate the success of these interventions.

E. Evaluations of AIDS Education Interventions

In a comprehensive review of the effectiveness of AIDS education programs through 1987, Becker and Joseph (1988) concluded that some groups, for instance homosexual men in San Francisco, showed a significant behaviour change in response to the AIDS health crisis. They pointed out that

programs targeting other groups had shown much less success. AIDS education has been far less successful in modifying the sexual behaviour of young heterosexuals. A growing body of literature reports on the limited impact of AIDS intervention programs on this population, despite the impressive number and variety of interventions that have been implemented.

Intervention efforts have been varied and broad in scope. The content of programs for heterosexual youth has ranged from comic books to lectures, and from videos to discussion groups. The length of programs has ranged from minutes to hours to extensive cognitive-behavioural programs lasting ten weeks or more. Target groups have included high school and college students, inner-city youth, runaways, and minority youth, both male and female. AIDS education has been designed to correct misconceptions about HIV and AIDS and to assist participants in developing ways to reduce their risk for HIV infection by reducing their risky behaviours. One problem is that the programs have been widely implemented, but not widely standardized, evaluated, or followed up. For the current purpose, I will limit this review to studies which have evaluated the impact of interventions on young heterosexuals. I will focus on representative studies from each of three partly arbitrary categories: brief, fact-based programs; medium length programs with more thorough coverage of HIV/AIDS knowledge and some attitude or behaviour change components; and comprehensive cognitive, attitude, and behaviour skills training programs.

AIDS Knowledge Interventions

There have been many evaluations of brief AIDS education programs that provide facts about HIV transmission with little or no emphasis on changing attitudes or providing behaviour skills training. Not surprisingly, these studies show that AIDS information alone does lead to an increase in knowledge, but does not change attitudes or current or intended future sexual risk behaviour. This finding applies to studies evaluating the use of comic books with young adults who have left school (Bellingham & Gillies, 1993); lectures, either alone in combination with videotapes, used with adolescents attending a clinic (Rickert, Gottlieb & Jay, 1990); videotapes for grade 6 and 7 students (Newman, DuRant, Ashworth & Gaillard, 1993); instructional videotapes (Rhodes & Wolitski, 1989) or informational brochures (D'Augelli & Kennedy, 1989) for college students; and an evaluation of students aged 10 to 18 years old who were interviewed before and after Magic Johnson announced he was HIV positive and spoke out about HIV transmission (Sigelman, Miller & Derenowski, 1993).

Other researchers have evaluated the impact of slightly longer AIDS education programs that contained only information, and they too have found that although AIDS knowledge increases following such programs, there are no measurable changes in attitudes or behaviour. For example, an early study of sexually active adolescents in San Francisco measured condom knowledge, attitudes, and use over one year during which media and public health

information about AIDS intensified, and AIDS was discussed in schools. The researchers found that although the perception that condoms prevented sexually transmitted diseases (STDs) was high, there was no increase in the use of, or intention to use condoms. Only 2% of the females and 8% of the males reported using condoms every time they had intercourse (Kegeles, Adler & Irwin, 1988). In another study of unmarried heterosexual undergraduate students who had completed a ten-week course in human sexuality which included information on AIDS and specifically heterosexual risk for HIV transmission, Baldwin, Whiteley and Baldwin (1990) found that the experimental group had an increased knowledge of the likelihood of contracting the virus after one act of unprotected vaginal intercourse. They also worried more about contracting AIDS from their sexual activity. Yet they did not increase their use of condoms, decrease their number of sexual partners, or spend longer getting to know their partners. Once again, the point is made that knowledge alone, even when presented thoroughly, is not enough to change behaviour.

Programs must do more.

Enhanced AIDS Knowledge Interventions

A second type of study looks at the impact of programs that include some attitude or skills training in addition to the informational component. These programs attempt to change not only knowledge, but attitudes and/or behaviour, and many of them were developed in response to the failure of information-only interventions.

These programs have had varying degrees of success, and direct comparisons between studies are difficult because of the large differences in methodologies and measures. For example, a Canadian study which evaluated an AIDS education unit for grade 9 students found an increase in knowledge but no attitude change (Buiteman & Fish, 1994). The authors caution that there may have been non-equivalent samples or a ceiling effect on their questionnaire. Another evaluation of a two-session program for grade 7 and 10 students found modest increases in tolerance for AIDS patients and the hesitancy to engage in high-risk behaviour, but the absence of a control group makes these results difficult to interpret (Brown, Fritz & Barone, 1989). An evaluation of an intensive five-day AIDS education program which employed a quasi-experimental design found that knowledge increased for girls but not for boys, and that a plateau effect for knowledge was indicated. Both sexes showed an increase in tolerant attitudes (Steitz & Munn, 1993). However, these researchers did not measure sexual behaviour.

In a study of the impact of a large school-based HIV/AIDS education program implemented in 128 randomly selected schools in Alberta, Doherty-Poirier & Munro (1991) carried out a pre-post test evaluation of the knowledge, attitudes and intended sexual behaviour of over 3000 grade 9 and 11 students. The interventions were conducted in the classroom by teachers and guest speakers, and AIDS information booklets were used. Knowledge and tolerant attitudes increased in both age groups, and intentions to engage in healthy

sexual behaviour increased in the grade 11 students. The large sample size and random selection of experimental and control school strengthen these findings. However, the methodology employed by these researchers has some limitations. First, group comparisons did not provide information about individual changes. Second, the post-test questionnaire had demand characteristics, in that the cover sheet stated that the researchers were interested in whether knowledge and attitudes had changed. Third, the researchers collected only limited information about sexual behaviour.

As for older students, Riley and Greene (1993) found that social work and nursing students showed more attitude change when they were exposed to medical information regarding AIDS/HIV in combination with psychosocial information and the opportunity for personal values clarification. Smith and Dickson (1993) reported on a study of sexually active heterosexual Ontario university students who participated in a thirty-minute AIDS education and condom desensitization intervention that included a film clip, discussion, and role-playing. Immediately following the intervention attitudes toward condoms and intentions to use them were elevated for intervention participants compared to those in the control group. However, condom use did not differ at a two-month follow-up. Again, the need for a more intensive intervention programs, careful methodology, and rigorous evaluation is emphasized.

Intensive Cognitive-Behavioural AIDS Education Interventions

In response to the urgent need for intervention programs that can show

a significant and long term impact on sexual behaviour, some researchers have designed AIDS education that combines the elements that research and theory have identified as crucial to program effectiveness.

The earliest and most widely known program of this type is the behavioural intervention developed by Kelly et al. (1989b) for use with homosexual men with histories of risky sexual behaviour. This comprehensive intervention (also known as Project Aries) included AIDS risk information, cognitive-behavioural self management training, sexual assertion training, and the development of social support. Twelve group sessions incorporating discussions, exercises and role-playing were used. Measures included several self-report inventories, self-monitoring of sexual risk behaviour, behavioural measures derived from ratings of audiotaped role-plays, and the AIDS Risk Knowledge Test. These authors reported that experimental participants reduced the frequency of high risk sexual practices and increased their behavioural skills for refusing coercive sexual demands compared to the waitlist control group. They also showed an increase in AIDS knowledge. These gains were maintained eight months later. Participants rated the intervention as extremely helpful for reducing AIDS risk, giving an average score of 8.9 out of a possible 10 points.

The impact of Project Aries on the behaviour of gay men appeared to be quite robust. Kelly and St. Lawrence (1990), reflecting on this research, made the point that shorter interventions might also be effective, and that program

length must be balanced with the need for adequate coverage of material. They found that a six-session program was also successful in creating significant behaviour change. The program also has been applied effectively to other groups; in other studies it has been found to increase the AIDS knowledge and condom use of high risk inner-city women (Kalichman, Kelly, Hunter, Murphy & Tyler, 1993), and to reduce unprotected intercourse, increase condom protected intercourse, and increase the behavioural skills of African-American adolescents (St. Lawrence et al., 1995).

Since the early reports of the effectiveness of Project Aries, there have been several published studies which have looked at the impact of similar intensive AIDS education interventions with young heterosexuals. Rotheram-Borus, Koopman, Haignere & Davies (1991) evaluated an intensive HIV prevention program for runaway adolescents in a nonrandomized control trial. Subjects were recruited from two publically funded shelters. The intervention included general AIDS information, development and rehearsal of coping skills, video and art workshops where participants developed commercials and "soap operas" about HIV and AIDS, private counselling sessions to target dysfunctional attitudes, and provision of health care resources. The number of sessions varied for each subject, with the mean being eleven. HIV sexual risk behaviour was evaluated at baseline and three and six months later. As the number of sessions increased, there was a significant increase in the reports of consistent condom use and a significant decrease in reports of high risk sexual

activity. There was no change in abstinence. These authors report that a minimum of ten sessions is likely necessary to change behaviour.

This study is encouraging for several reasons. First, it indicates that intensive AIDS education does seem effective in changing the sexual behaviour of adolescents. Second, these changes were seen in runaway adolescents, who tend as a group to have higher levels of risk behaviour and to have unstable lifestyles that may make this behaviour even more resistant to change than for other adolescents. Third, the intervention is quite portable, and can be adapted to other groups and settings.

Other researchers have demonstrated similar findings with young heterosexuals. Jemmott, Jemmott and Fong (1992) compared two groups of black adolescents. One group participated in a five-hour AIDS education program comprising information, videos, games and role-playing, and the other received a career counselling program. Immediately following the intervention the AIDS education group had higher AIDS knowledge, less favourable attitudes toward risky sex and intentions to engage in less risk behaviour. At three month follow-up, these participants reported a lower frequency of intercourse, fewer partners, and greater condom use. This study indicated that an intensive one-day program can still have measurable effects on sexual behaviour. Another interesting finding was that greater attitude changes (less positive attitudes towards sexual risk behaviour) were found for adolescents in sessions with female facilitators. The authors did a manipulation check to

ensure intervention integrity, and they did find that the participants were involved in the exercises and attending to the information. They also tried to control for social desirability biases in responses by ensuring confidentiality.

In another study which employed random assignment of subjects to intervention or a waitlist control, Kipke, Boyer, and Hein (1993) evaluated the impact of three 90-minute AIDS education sessions on groups of primarily black and Hispanic adolescents aged 12 to 16. Information on HIV, instruction and demonstrations of condom purchase and use, personal risk evaluation, decision making and behavioural skills training, and peer group support were emphasized. The measures used at pretest and post-test included questionnaires about AIDS knowledge, negative attitudes, perception of risk, self efficacy and risky behaviour, as well as assessment of videotaped role plays of sexual and dating situations. Significant post-test differences between the groups were found on the following variables; knowledge increased, negative attitudes decreased, there was a change toward more accurate risk assessment and appropriate concern about personal HIV risk, and an increase in the behavioural skills for negotiating preventive actions and resisting peer pressure to engage in risky sexual behaviour.

These findings indicate that even a shorter, comprehensive program can be effective. However, this study had a fairly small sample size, only 30% of the youth were sexually active, and the authors did not measure self-reported sexual risk behaviour, and so these finding must be interpreted with caution. As

with the other studies, these results need replication with large samples, different groups of young adults, and long term follow-up.

Summary

Sexual behaviour is a very complex aspect of human behaviour, and like any complex behaviour it is very difficult to change. However, this survey of AIDS education evaluations inspires cautious optimism about the potential for changing the AIDS-related attitudes and behaviour of young heterosexuals. A decade of research has identified some crucial components for successful interventions. In a chapter surveying school-based interventions to prevent HIV transmission, Kirby and DiClemente (1994) give an excellent summary of the elements that are shared by programs that successfully promote behaviour change. These programs are based on social learning theories; focus on teaching and reinforcing specific values, skills and behaviours, such as using condoms, rather than providing only general information; tailor the information and targeted skills to the age and gender of the students; use active teaching techniques so that students are involved in generating, obtaining, and sharing information, and participating in experiential exercises; include material on the social, peer and media influences and pressures to have sex; and encourage students to practice responses to these pressures by using modelling and role playing.

Conclusions

At the beginning of this chapter I set out to give the context for AIDS

education interventions with young heterosexuals, and describe the elements of successful programs. This literature review indicates that young people engage in high-risk sexual behaviour regardless of their knowledge and understanding of HIV transmission. AIDS education that focuses on cognitive change by providing information about HIV transmission and the reality of the risk of heterosexual activity may have no effect on actual sexual behaviour. It is crucial that research move from simple AIDS information to multi-faceted AIDS education, in which interventions attempt to change attitudes and beliefs, break down the barriers between self and other, personalize risk, provide skills and motivate participants for the desired behaviour change. Given these conclusions, the need for further evaluation of AIDS education that targets attitude and behaviour change is apparent.

F. The Present Study

This brings us to the current research project. It describes the outcome of a novel AIDS education program for heterosexual university students that was aimed at increasing AIDS knowledge, changing attitudes toward AIDS and Persons with AIDS (PWAs) that may prevent behaviour change, and decreasing high-risk sexual behaviour. A quasi-experimental preintervention-postintervention design was used to evaluate the following hypotheses:

1. Students will score higher on a measure of AIDS knowledge following the intervention (AIDS education course).
2. Students will report more tolerant attitudes following the intervention.

3. Students will report a decrease in high-risk sexual behaviour following the intervention.

CHAPTER 2: METHOD

A. Participants

Participants were recruited from five undergraduate psychology courses at Simon Fraser University. The participation rate was very high: approximately 99% of students who attended class on the days data were collected completed the questionnaires. However, data for approximately 30% of participants were discarded because the participants were absent for either the preintervention or the postintervention session. A further 7% of the sample was discarded because participants defined their sexual orientation as homosexual or bisexual, or because they were above the age of 30. These exclusions limited the sample to young heterosexual adults between the ages of 17 and 30 who had complete data for both the preintervention and the postintervention test sessions, resulting in a total sample size of 563.

For the entire sample, the average age was 20.57 years ($SD = 2.41$). Seventy-two percent of the participants were female, and 75% of the sample were coitally experienced (i.e., 25% defined themselves as virgins). Table 1 presents descriptive statistics for the entire sample.

For the questions regarding sexual behaviour, the sample was limited to coitally experienced students (i.e., those who reported that they were not virgins). Sexually active participants ($N = 405$)¹ reported the average age of

¹

This value is slightly lower than 75% of the total sample, due to the omission from these analyses of some subjects with missing data.

Table 1

Distribution of Subjects by Demographic and Sexual History Variables

Total Sample (N=563)	M	SD	%
Age (years)	20.57	2.41	
Gender (female)			72
Virgins (coitally inexperienced)			25
Academic Program			
Arts			10
Science			33
Education			36
Business			19
Other			2
Sexually Active Subjects (N=405)			
Age (years)	20.73	2.54	
Gender (female)			72
Age at first intercourse	16.91	1.82	
Total number of sexual partners	5.24	9.07	
Relationship with most recent sexual partner			
Spouse			7
Fiancé(e)			6
Steady partner			65
Casual partner			18
Other			6
Frequency of oral intercourse in previous three months	9.98	13.81	
Frequency of vaginal intercourse in previous three months	20.65	23.43	
Ever use condom (yes)			92
Used condom in most recent intercourse (yes)			38
Intend to use condom in next intercourse (yes)			52
Intend to use condom in next intercourse with a new partner (yes)			98
Percent of vaginal intercourse occasions in previous three months during which condoms were used	35	43	
Never used			54
Always used			14
Had an HIV test (yes)			20

first intercourse as 16.91 years ($SD = 1.82$). The total number of sexual partners ranged from 1 to 50, with an average of 5.24² ($SD = 9.07$). A majority of these subjects reported that their most recent sexual partner was a "steady partner."³ Mean frequency of oral intercourse and vaginal intercourse in the preceding three months was 9.98² ($SD = 13.81$, range 0-50) and 20.65² ($SD = 23.43$, range 0-75). Only four percent of the sample reported engaging in anal intercourse. Although most of the sexually active subjects reported they had used a condom at least once, only 38% had used a condom in their most recent intercourse, and only 14% of participants reported using condoms on every occasion during the previous three months.

There were five different groups of subjects, hereafter referred to as experimental group 1 (EG1), experimental group 2 (EG2), control group 1 (CG1), control group 2 (CG2), and control group 3 (CG3). Descriptive information regarding key demographic variables is shown for all five groups in Table 2 and discussed in the Results section.

The two experimental groups, EG1 ($N = 204$) and EG2 ($N = 184$) participated in the AIDS education intervention. These groups consisted of students taking the course Psychology 106 "Psychosocial Parameters of AIDS

² These means and ranges are corrected for outliers.

³ Participants interpreted these terms for themselves (i.e., steady partner and casual partner were not specifically defined).

and HIV infection."

Table 2

Comparison by Group on Potential Confounding Variables at Baseline

	EG1 N=204		EG2 N=184		CG1 N=62		CG2 N=64		CG3 N=49		Significance
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age(years)	19.98	1.96	21.04	2.33	21.14	3.02	21.55	2.51	19.07	2.01	$F(4,554)=15.88, p<.001$
Gender (% female)	78		68		64		69		79		$X^2_{(4)}=8.83, p=.06$
Virgins (%)	29		25		15		20		27		n.s.

CG1 (N = 62) consisted of students enrolled in a different section of the course Psychology 106, where the content concerned drug issues and social policy. However, there was one lecture in this course, and one chapter in the textbook, that dealt with HIV/AIDS in relation to intravenous drug use. Given that there was a potential confound of the exposure of CG1 to some AIDS information, it was decided to obtain additional control groups from first and second year psychology courses other than Psychology 106.

CG2 (N = 64) consisted of students taking a second year undergraduate course in psychopathology. Those students who had previously taken either section of psychology 106 (n = 36) were excluded.

CG3 (N = 49) consisted of students who were enrolled in a first year general psychology overview course, and who were contacted through the undergraduate subject pool at Simon Fraser University.

Follow-up participants. A subsample of EG2 completed follow-up

questionnaires ($n = 70$). Because of the loss to follow-up among experimental subjects, analyses were conducted to determine the potential impact of attrition on the interpretation of these results. Scores for those EG2 subjects who did complete the follow-up were compared to those of EG2 non-compliers on age, gender, and virginity. T -tests and chi square analyses indicated that they were a representative subset of the larger group, except that the follow-up sample had a significantly higher proportion of women, $X^2(1) = 16.44, p < .001$.

B. Measures

The AIDS Risk Knowledge Test

Knowledge of AIDS risk behaviour was assessed using the AIDS Risk Knowledge Test (ARKT) developed by Kelly, St. Lawrence, Hood and Brasfield (1989a; see Appendix A). This standardized 40-item test, which uses a true/false format, has been shown to be a useful dependent measure when evaluating the impact of AIDS prevention programs. The test yields a summed total score based on the number of correct responses. The ARKT has been used with various populations that include homosexual men and heterosexual male and female college students. Mean scores for various samples range from 31.7 to 36.2, which indicates a high level of general AIDS knowledge. This may create a ceiling effect and range restriction on this measure.

The content of the items reflects three general areas: high-risk sexual and drug behaviours, risk reduction steps, and misconceptions regarding HIV and AIDS. Reported psychometric properties (Kelly et al., 1989a; Lewis, Range &

Oberhausen, 1993) indicate that the ARKT is reliable (test-retest = .84) and has modest internal consistency (Spearman-Brown split half reliability coefficient = .73; Kuder-Richardson reliability coefficient = .74, alpha = .63). In a review of published studies of AIDS knowledge in the Western world, Peruga and Celentano (1993) state that the ARKT has the best reliability of AIDS knowledge measures. Validity is supported by improvement in scores following an AIDS education intervention, and by a factor analysis which indicated one factor that accounted for 85.6% of the test variance (Kelly et al., 1989a).

For the current study, a preliminary examination of the scores on the ARKT at preintervention was performed. Because there was a very small amount of missing data (6% of subjects missed one or two items, and 1.5% missed between three and six items) and the presence of missing data was not correlated significantly with the total score, a score of zero was substituted for the missing data points.

Four items eventually were dropped from the total score for each subject for the following reasons. Before the study was conducted, three items (3, 10, and 15) were identified as being problematic. Due to the rapid changes in what we know about transmission of the HIV virus, these items from the 1989 test were no longer unambiguous, and there is uncertainty regarding the correct answer. Based on this reasoning, which was supported during a telephone conversation with the author of the ARKT, it was decided to delete these three items. The cogency of this decision was supported by the preliminary data, which showed

that students were split in their responses to these items. A fourth item (39) was omitted from analyses because it had no variability (i.e., all participants knew the correct answer). A fifth item (23) was retained, but the direction of scoring was reversed to reflect the changes in knowledge since the test was published. This resulted in a maximum score of 36.

Based on this 36 item scale, analyses of the descriptive characteristics of total scores at preintervention, and scale reliability analyses were performed. The mean total score out of 36 for the entire sample was 32.12 (SD = 2.31), and the range was from 23 to 36. Table 3 presents ARKT scores at preintervention, postintervention, and follow-up. The standardized item alpha for the scale was .54, and the mean inter-item correlation was .03. Although these values are low (possibly the result of range restriction), they were considered acceptable for the purposes of the current study.

The decisions to omit and reverse items and recode missing data to zero were made based on preintervention data and thus were independent of the outcome (postintervention and follow-up) scores. Assumptions were also tested at preintervention, and then the same steps were applied to the outcome scores, based on the 36 item scale. For the postintervention scores, the mean total out of 36 was 33.66 (SD = 2.07). For the follow-up scores, the mean was 34.25 (SD = 1.67). Eleven items had zero variance at follow-up,⁴ and so the reliability statistics were based on 25 items.

⁴ Items 1, 4, 5, 6, 8, 11, 12, 18, 21, 37, and 38.

Table 3

AIDS Risk Knowledge Test Scale Characteristics

	<u>M</u>	<u>SD</u>	α	mean inter-item correlation
Preintervention	32.12	2.31	.54	.03
Postintervention	33.66	2.07	.54	.03
Follow-up	34.25	1.67	.44	.03

Note. $N=563$ for preintervention and postintervention, $n=70$ for follow-up.

The AIDS Attitude Scale

Attitudes toward AIDS and PWAs were assessed by the AIDS Attitude Scale (AAS; Shrum et al., 1989; see Appendix A), which was developed for use with college students. Factor analysis of this scale indicates that three factors account for 45% of the variance in response patterns. The first factor is broadly concerned with proximity to PWAs, and it appears to reflect personal fears about being around someone with a communicative, fatal disease. The second factor is composed of items related to AIDS as a moral issue, and appears to reflect moral and judgemental attitudes to AIDS and PWAs. The third factor includes items reflecting social welfare and legal issues.

The AAS is a standardized 54-item questionnaire that uses a 5-point Likert scale response ranging from strongly agree to strongly disagree, with half the items worded tolerantly and half intolerantly. Higher scores indicate more tolerant attitudes. Shrum et al. (1989) report high internal consistency ($\alpha = .96$). In a sample of undergraduate students, the mean attitude score was 183.24 ($SD = 15.33$). Demographic effects were observed for sex and age, with

females expressing more tolerance than males, and tolerant attitudes increasing with age.

For the present research, the scores of all participants on the AAS at preintervention were examined. Ninety-six percent of subjects had no missing data on this scale. Three subjects who had more than 20% missing data were deleted from the analyses. For the remaining 4% of subjects who had between one and three missing data points, the missing values were replaced with the average score on the items that were answered.

Due to a printing error, item 26 was absent from the questionnaire. After inspection of the descriptive data, all of the other items were retained, resulting in a total scale score out of 53 items. The mean at preintervention was 220.03 ($SD = 24.44$) with a range from 135 to 265.

Reliability analyses on the final scale totals out of 53 at preintervention revealed a standardized item alpha of .95 and a mean inter-item correlation of .26. These values indicated that this a unidimensional scale with high item homogeneity. See Table 4 for AIDS Attitude Scale characteristics at preintervention, postintervention, and follow-up.

The same scoring procedure was followed for the scores at postintervention. Ninety six percent of cases had no missing data, 8 subjects were excluded for having more than 20% missing data, and the few subjects with between one and three missing data points had their mean score on the other items substituted for the missing items. The mean postintervention score

was 233.31 (SD = 22.62), range 114 to 265. For follow-up participants there were no missing data, and the mean total score was 237.61 (SD = 18.98).

Table 4

AIDS Attitude Scale Characteristics

	<u>M</u>	<u>SD</u>	α	mean inter-item correlation
Preintervention	220.03	24.44	.95	.26
Postintervention	233.31	22.62	.95	.27
Follow-up	237.61	18.98	.95	.25

Note. N=563 for preintervention and postintervention, n=70 for follow-up.

Self-reported change. In addition to this objective measure, AIDS education intervention participants' attitudes, specifically toward homosexuality, were investigated by way of self-report (see Appendix A). Students in the AIDS education group were asked whether their attitudes toward homosexuality had changed as a result of taking the course. An open-ended question then asked them to indicate the ways that they felt their attitudes had changed.

Sexual Risk Behaviour Survey

Sexual behaviour was assessed using a self-report questionnaire designed by the researcher and modelled after the Risk Behaviour Survey (RBS) designed by Kelly et al. (1989b) for use with homosexual men. The content was adapted for use with heterosexual university students (see Appendix A).⁵ This measure elicited information about the students' sexual

⁵EG1 received a different version of the RBS. It did not include questions 1,5,7, or 14. Questions 5,6 and 13 were not open ended, but instead they gave a forced

behaviour history, as well as information about specific sexual behaviours over the past three months.

The RBS was scored to yield information about the total number of sexual partners, the relationship with the current partner, condom use, the frequency of vaginal, oral, and anal intercourse, the number of sexual partners over the last three months, and the proportion of intercourse occasions on which condoms were used.

A preliminary look at the RBS data at preintervention indicated that several items were not useful for further analysis. The frequency of anal intercourse was very low (reported by less than 4% of the sample) and so the questions regarding the frequency and percentage condom use of anal intercourse were omitted. Less than 4% of the sample reported using condoms for oral intercourse, and so this item was omitted. The number of sexual partners in the last year did not yield any useful information, since the total number of partners and the number of partners in the last three months were also asked, and so this question was dropped. The scores at preintervention on the dependent measures of sexual risk behaviour for the sample are reported in Table 1. All data on sexual risk behaviour are reported for sexually

choice of categories (e.g., 0, 1, 2-3, 4-6 etc. sexual partners and 0-25%, 25-50%, etc. condom use during intercourse in the last three months). The scores for the EG1 participants were scored to match the format of the RBS the other participants received. Results for the four questions omitted from this earlier survey are reported for the other four groups only.

active students only, thereby excluding coitally inexperienced participants (virgins).

The scores on several sexual practices variables (the number of sexual partners and the frequency of oral and vaginal intercourse) were positively skewed, with numerous subjects reporting zero values and a small percentage of subjects reporting extreme values. Prior to any other statistical analyses being performed, the raw scores were adjusted by substituting the highest non-outlier value for the extreme scores. The means for these variables in Table 1 are corrected means. The values were then linearly transformed prior to analysis using the formula $\log(X + 1)$ to correct for the skewed distribution (Kelly et al., 1989b). Analyses were performed on these log-transformed values.

Most of the information collected on the RBS was for descriptive purposes, and it is presented in the Participants section. However, a measure of sexual risk behaviour was needed to examine whether the educational intervention led to behaviour change. A composite score of relative sexual risk was computed for this purpose. Participants received a score based on their combined responses to the items regarding the number of partners, frequency of vaginal intercourse, and percentage of condom use during the previous three months. This score reflects relative risk only, and does not imply any meaningful comparison of the absolute level of risk for HIV infection.

The relative sexual risk behaviour score was computed as follows. First,

the frequency of unprotected sex during the past three months was determined.⁶ Participants with no unprotected vaginal intercourse in the last three months (e.g., no intercourse occasions or 100% condom use) were considered "no risk," and they received a score of 0. Participants with 1 to 10 episodes of unprotected intercourse during the last three months were considered "low risk," and received a score of 1. Participants with more than 10 unprotected intercourse episodes were considered "high risk," and received a score of 2. Second, the number of sexual partners in the last three months was assigned a "no risk" (0 partners = 0), "low risk" (1 partner = 1) or "high risk" (2 or more partners = 2) score. Then these two scores were multiplied together to give the final relative sexual risk score. This score ranged from 0 to 4. Table 5 shows the distribution of subjects on these sexual risk variables at preintervention.

This relative risk score is by necessity an imperfect measure of sexual risk for HIV transmission. However, it is not possible to get a measure of absolute risk for the sexual transmission of HIV. The chances of HIV infection resulting from a single unprotected vaginal intercourse occasion with an infected partner are not known (Krause, 1993). Another complicating factor is that for the purposes of this research we have no information about the risk behaviour of the partners of the participants, and so must arbitrarily consider all

⁶

Frequency of unprotected sex = frequency of intercourse - (frequency of intercourse x % condom use)/100

partners to be of equal risk. Obviously this is imprecise, and a subject who engages in unprotected vaginal intercourse 10 times with one long term partner, both of whom have no other risk behaviour, could receive the same relative risk score as a subject with one casual sexual partner of unknown risk behaviour, with whom they use condoms on half of 20 intercourse occasions. Yet the second person is in fact engaging in more risky sexual behaviour. However, given the restrictions in the knowledge of actual transmission risk and the limitations of the available data for this study, it was decided that the composite relative risk score provided a more meaningful and accurate assessment of sexual risk than did the individual variables.

Table 5

Distribution of Sexually Active Subjects on Sexual Risk Variables at Preintervention

	<u>n</u>	<u>%</u>	<u>M</u>	<u>SD</u>	<u>Min.</u>	<u>Max.</u>
Frequency of unprotected sex in previous three months	372		13.33	19.71	0	100
Frequency recode						
No risk (no unprotected sex)	123	33				
Low risk (1-10 unprotected sex)	113	30				
High risk (>10 unprotected sex)	136	36				
Number of sexual partners in previous three months	372		.96	.67	0	8
Partners recode						
No risk (0)	65	16				
Low risk (1)	303	75				
High risk (2+)	37	09				
Relative risk index						
No risk (0)	127	34				
Low risk (1)	101	27				
Medium risk (2)	134	36				
High risk (4)	13	03				

Self-reported change. In addition to the Risk Behaviour Survey of actual behaviours in the previous three months, change was investigated by way of self-reports (see Appendix A). Students in the AIDS education group were asked whether they had changed their sexual behaviour as a result of taking the course. An open-ended question then asked those who indicated they had changed to describe the type of changes, and what aspects of the course they found influential.

C. AIDS Education Intervention

The intervention consisted of a semester long undergraduate psychology course taught at Simon Fraser University. Psychology 106 "Psychosocial Parameters of AIDS and HIV Infection," was taught by Pat Tucker. Ms. Tucker was a sessional instructor at Simon Fraser University and the director of AIDS Consulting and Education Services. She also ran The Street Project, a counselling resource for Vancouver street-involved persons on the HIV/AIDS continuum. She brought her extensive knowledge and experience to the design and teaching of this course. As well, she was known for her relaxed, "street-wise" style and forthright presentation of controversial material.

This course gave a thorough overview of the biological, psychological and social aspects of the HIV pandemic (see Appendix B for the course outline and reading assignment list). The course format consisted of lectures (one per week, two hours in duration) and small group tutorials (one per week, one hour in duration, maximum eighteen students) for 13 weeks. The tutorials were a key

aspect of this intervention. Group participation in discussions and exercises was strongly encouraged, and accounted for 10% of the course grade. The course also included required readings, two examinations and a short essay assignment.

This course took traditional AIDS education a step further by directly targeting attitudes and risky behaviours, and attempting to change them, as well as to increase knowledge. The course objectives were to help the students develop an understanding of AIDS that would (a) enable them to make informed choices about their behaviour so that they could remain safe from infection, and be able to pass this information on to others and (b) instill an understanding and empathy about the impact of HIV disease on the individual and the community.

The course content covered the physiological facts and theories regarding HIV virology, HIV transmission and prevention, the HIV antibody test, and symptoms and diagnosis of AIDS and HIV illness. Lectures and small group tutorials included detailed discussions of sexual behaviours and safer sex. During one tutorial, condoms were distributed and demonstrated. Condom use was discussed in terms of HIV prevention, and students were instructed and encouraged to incorporate condoms into erotic foreplay. Each student was given some condoms both to open and handle in the tutorial, and to take home. Alternative, lower risk sexual behaviours to intercourse were discussed. The reality of heterosexual transmission of HIV, and the risk to sexually active

persons regardless of sexual orientation, was emphasized throughout the course. The goal was to provide students with the knowledge and ability to make a realistic evaluation of their own sexual (and other) HIV risk behaviour, so that they could make informed choices about their future behaviour, and possess the skills to implement these choices.

The course also extensively covered the psychological and social aspects of the continuum of HIV infection. Psychology's role in the health crisis, from prevention to care, was discussed, with a focus on providing students with an understanding of what HIV and AIDS mean for infected persons, as well as for all of us. Topics included behaviour change, fear of contagion, grief and loss, AIDS dementia, spirituality, death and dying, psychological needs, and ethical issues. Clinical issues for therapists and others working with PWAs, such as therapeutic goals and countertransference, were discussed. Many relevant social phenomena and issues were explored, including the gay community, homophobia, heterosexism, women and AIDS, and injection drug use. Attitudes towards AIDS, PWAs, sexuality, sexual orientation, religious beliefs, condoms, drug use, disease and death were discussed and students were encouraged to examine their own attitudes and biases and challenge any unexamined beliefs.

Another focus of the intervention was to put a human face on AIDS, and to challenge and break down the barriers between the students and the "other" (e.g., homosexual, drug user, PWA) in order that the students might both have greater empathy, understanding, and acceptance of the other, and include

themselves in that human family who are at risk for infection. This was achieved through the lecture material focusing on marginalization and discrimination, tutorial exercises which encouraged the students to "experience" the effects of discrimination and the impact of having HIV infection, films, and the presentation of case studies. However, arguably the most powerful part of the intervention was the "AIDS Panel."

A panel of five persons with HIV infection and/or AIDS attended one lecture. The panel was made up of men and women of varying sexual orientations, ages, and circumstances, who became infected with HIV through various behaviours. These speakers discussed their personal lives, their infections, and emphasized the risks inherent in certain behaviours in a very frank manner. Students were then given the opportunity to question them at length, both in the large group, and in smaller groups who meet with one of the panel members for a more intimate discussion.

In content and process, this course was more in depth and included more direct safer sex education than any educational programs for university students identified in my literature review. It was designed not only to provide information, but to challenge cognitive processes and attitudes that influence the evaluation of personal risk and subsequent decisions about behaviour change. In targeting attitudes, the course attempted to increase understanding, tolerance and empathy for PWAs and other marginalized persons. It was hoped that this in turn would help students to break down their sense of "self versus

other," and to personalize HIV risk. The course attempted to decrease risky sexual behaviour in university students by educating them about risk behaviour and providing them with the knowledge and skills to decrease their risk, and the motivation to do so.

D. Procedure

This study used a quasi-experimental pre-post intervention design, with a eight month follow-up of a subsample of the second experimental group. As outlined in the Participants section, there were five non-randomized groups of students, two experimental groups and three control groups, with data collected in four semesters. An outline of the design used to evaluate the impact of the AIDS education intervention is presented in Table 6.

Table 6

Quasi-experimental Design of the Evaluation of the AIDS Education Intervention

Groups	Pre-intervention	N	Received AIDS Education Intervention	Post-intervention	Follow-up (n=70)
EG1	Yes (Sep. 92)	204	Yes	Yes (Dec. 92)	No
EG2	Yes (Jan. 93)	184	Yes	Yes (Apr. 93)	Yes (Nov. 93)
CG1	Yes (Jan. 93)	62	No	Yes (Apr. 93)	No
CG2	Yes (Jan. 94)	64	No	Yes (Apr. 94)	No
CG3	Yes (Sep. 93)	49	No	Yes (Dec. 93)	No

The AIDS Risk Knowledge Test, AIDS Attitude Scale, and Risk Behaviour

Survey were administered at the same time.⁷ Prior to distributing the questionnaires, the general nature of the study was described. Students were informed that the study was conducted with the approval of the Ethics Review Committee at Simon Fraser University, that the research was completely anonymous, and that their voluntary participation would in no way influence their mark in the course. Given the sensitive nature of the information being requested in this research, all participants were asked to write a code name on each set of questionnaires.⁸ This was done in an attempt to reassure participants of their anonymity, and to maximize the probability of honest responses. This code name allowed matching of each participant's preintervention and postintervention data.

For EG1, EG2, CG1, and CG2, participants were initially asked to complete the questionnaires as a group during the first lecture of the semester. For EG1 and EG2, the postintervention data was collected during the last tutorial; for CG1 and CG2, during the last lecture. CG3 students were recruited from the undergraduate subject pool, and they completed the questionnaires in

⁷ Students in EG2 and CG1 completed two additional questionnaires as part of a separate research study. These were the Temperance Questionnaire (Alexander, Lavis, van Wijngaarden & van der Wijngaart, 1992) and a measure of Authoritarianism.

⁸ EG1, CG2 and CG3 participants created an alphanumeric code based on their birthdate and mother's maiden name. EG2 and CG1 participants invented their own code name. These participants also completed questionnaires for another study, and that was the code name protocol for the second study.

small groups (6 to 10 students) at the beginning and the end of the semester.

Experimental group participants received one additional page of open ended questions (see Appendix A) which were intended to (a) yield an estimate of the proportion of students who subjectively reported changes in homophobia and sexual risk behaviour and (b) provide information about what aspects of the intervention were perceived as being most effective for promoting behaviour change.

Follow-up data were collected from a portion of the students in EG2. In order to collect this follow-up information while maintaining participants' anonymity, after they completed the postintervention questionnaires in the last tutorial EG2 students were asked to write their address on an envelope. These envelopes were then collected, and the the ARKT, AAS and RBS follow-up questionnaires were mailed out seven months after the postintervention. Participants were requested to complete and return the questionnaires anonymously in an enclosed stamped, addressed envelope.

E. Data Analyses

Analyses for the dependent measures of Knowledge (AIDS Risk Knowledge Test scores) and Attitudes (AIDS Attitude Scale scores) were performed using all participants. Analyses for the dependent measure of Sexual Behaviour (the composite relative risk score) were performed using only coitally experienced participants.

Preliminary analyses were performed to check the assumption of

preintervention group equivalence on the dependent measures. In addition, the five groups were analyzed to determine whether they differed at preintervention on the demographic variables or dependent measures. These assumptions of group equivalence were met, and the five groups were collapsed into two (Intervention and Control). Analysis of Covariance was then used to investigate the impact of the intervention. Three univariate ANCOVAs were performed, one for each dependent measure, using preintervention scores as the covariate. These ANCOVAs addressed the research questions (namely, does the AIDS education intervention increase AIDS knowledge, create more tolerant attitudes, and decrease high risk sexual behaviour?) by comparing the scores of the AIDS education participants to the control participants at postintervention.

Supplementary analyses were conducted to investigate changes on other sexual behaviour variables as a result of the AIDS education intervention. Further analyses compared postintervention scores to follow-up scores for the self-selected subgroup of intervention participants to investigate whether changes observed at postintervention were maintained over time. Finally, intervention group participants' self-reports were scored to give a measure of their subjective impression of changes in their attitudes and sexual behaviour.

All data analyses were carried out using SPSS for Windows release 6.0 (Norusis, 1993).

CHAPTER 3: RESULTS

A. Preliminary Analyses

Before the tests of intervention effects could be performed, it was necessary to explore the preintervention data to examine any relationships between demographic variables and dependent measures and to test for group equivalence.

Correlations between Demographic and Dependent Variables at Preintervention

Correlations were computed between the demographic variables of Age, Virginity, and Gender and the dependent variables of Knowledge, Attitudes and Sexual Behaviour for the entire sample at preintervention. Table 7 presents the correlations between these key variables.

Table 7

Correlations Between the Three Dependent Variables and Key Demographic Variables at Preintervention

	Knowledge	Attitudes	Sexual Behaviour	Age	Gender	Virginity
Knowledge ^a	1.0	.33*	.21*	.02	.05	-.17*
Attitudes ^b		1.0	.15*	.02	.22*	.16*
Sexual Behaviour ^c			1.0	.17*	.06	-.50*
Age				1.0	-.10**	.18*
Gender					1.0	-.01
Virginity						1.0

^aARKT scores, ^bAAS scores, ^cRelative risk index composite variable for sexual risk behaviour; * $p < .001$, ** $p < .05$.

For the demographic variables, Age was significantly correlated with Gender, indicating that males in the sample tended to be older. Age was also significantly correlated with Virginity, illustrating that younger subjects were more likely to be coitally experienced than older subjects. This finding at first seems counterintuitive, but may indicate that the smaller proportion of students who are not coitally experienced (25%) have chosen to delay sexual activity for personal, moral, religious or other reasons, and so represent a generally older group of students. There was no significant correlation between Gender and Virginity for this sample, which indicates that females were no more likely than males to be coitally experienced.

Examinations of the correlations between the dependent variables and demographic variables revealed that Knowledge (score on the AIDS Risk Knowledge Test) did correlate significantly with Virginity, $r = 0.17$, $p < .001$. Sexually active subjects had higher Knowledge scores. There was no difference in Knowledge between males and females, and no correlation between Knowledge and Age.

Attitudes correlated significantly with Gender and Virginity, with females and coitally experienced subjects reporting more tolerant attitudes. The finding that females are more tolerant than males has been reported in the literature (e.g., Goh, 1993; Shrum et al., 1989). The finding that virgins were less tolerant than coitally experienced students is interesting, and may indicate that coitally inexperienced subjects are more timid or conservative in their attitudes toward

AIDS, as well as sexuality. Perhaps this correlation, and the correlation between Virginity and Age, are influenced by the smaller proportion of virgins to coitally experienced subjects in this sample (approximately 1:4). Age was not correlated with Attitudes.

The most significant correlation ($r = .50$, $p < .0001$) was between Sexual Behaviour and Virginity. This is expected, of course, and it indicates that coitally experienced subjects do in fact have more reported risk behaviour. The fact that this is not a higher or even a perfect correlation is likely due to the fact that some coitally experienced subjects (non-virgins) reported very low or no occurrences of sexual activity during the three month retrospective periods sampled in this study. In addition, sexual risk is defined here by the composite relative risk variable that is coded from zero to four, and the restriction of variance on this variable might also affect the correlation with the categorical variable of Virginity. Age was also significantly correlated with Sexual Behaviour, with older subjects indicating higher levels of sexual risk behaviour.

As for the relationship between dependent measures, there were significant correlations between Knowledge, Attitudes and Sexual Behaviour. These correlations indicate that participants who attained higher AIDS Risk Knowledge Test scores demonstrated more tolerant attitudes, as shown by their higher AIDS Attitude Scale scores. In addition, higher scores on both Knowledge and Attitude measures were seen in subjects with higher levels of self-reported sexual risk behaviour.

In summary, at preintervention there were significant correlations between demographic and dependent variables. These relationships between the demographic and dependent variables indicated that Age, Gender and Virginity should be controlled for in subsequent analyses.

Examination of Intervention by Section Effects

As outlined in the Methods section and detailed in Table 6, this study employed a quasi-experimental design using five groups of participants (Section). Two experimental groups (Intervention) received the AIDS education intervention, and three control groups did not. Before proceeding to test the Intervention effects, it was necessary to address the potential confound between Section and Intervention.

As participants were not randomly assigned to Section, the Section variable was confounded with Participants. It could not be assumed that students within a Section were independent. If the Section data were pooled within Intervention without testing whether the Participants within Section nesting was important, Participants might be weighted unequally. Another caution pertaining to the Section effect was that experimental groups might differ in their response to the AIDS education intervention. If the two experimental group Sections were pooled into one, any differential response to the course could be masked. Given these potential confounds, it was necessary to test for a Section by Intervention interaction before proceeding with ANCOVAs on postintervention scores for the pooled intervention versus

control groups.⁹

In summary, it was important to test whether it was appropriate to pool the five Sections into experimental versus control groups (Intervention) before proceeding to subsequent analyses. To test for differences, F ratios were calculated for each of the dependent measures to test for significant differences between Sections within levels of Intervention.¹⁰ There were no significant Section by Intervention effects for any of the three dependent measures (all $F < 2$). This showed that there were no significant differences in Knowledge, Attitudes or Sexual Behaviour between Sections within levels of Intervention. This confirmed that the five groups did not differ within Intervention and that outcome was not differentially affected by the Section in which a subject

⁹ These analyses were indicated because the model is a random effects one. However, Section cannot be considered a random effect, and so the error term must be adjusted. To determine the appropriate error term, the MS for the effect is divided by the MS for the random source of variation. In this case, the random source (Participants) is nested within the various levels of the fixed factor, Section. A combined error term of Participants within Section within Intervention is the appropriate choice for this analysis. See Rosenthal and Rosnow (1991) for a discussion of choosing the appropriate error term in repeated measures designs.

¹⁰ These F tests were calculated in the following manner. First, parallel univariate ANOVAs were conducted on the postintervention scores, using no covariate, with either Intervention or Section as the main effect, Gender and Virginitiy as factors for Knowledge and Attitudes, and Gender as a factor for the Sexual Risk variable. Then the sums of squares Intervention was subtracted from the sums of squares Section, divided by the degrees of freedom, to obtain the mean squares Section by Intervention. This MS_{BETWEEN} was divided by the MS_{WITHIN} to obtain an F .

participated. This meant Sections could be collapsed and the postintervention analyses conducted by Intervention, combining the two experimental groups and the three control groups.

Comparison of Intervention and Control Groups on Demographic Variables at Preintervention

In order to examine the assumption that Intervention and Control groups were equivalent on demographic factors at preintervention, a one-way analysis of variance on Age and chi square analyses on the categorical variables of Virginity and Gender were performed. There were no significant differences between groups on Age ($F < 2$), or in the proportion of males to females or coitally inexperienced to experienced subjects. Table 8 shows means and percentages for these variables by Intervention.

Table 8

Distribution of Subjects by Demographic Variables and Experimental Condition at Preintervention

	Intervention Group			Control Group		
	<u>M</u>	<u>SD</u>	<u>%</u>	<u>M</u>	<u>SD</u>	<u>%</u>
Age (years)	20.43	2.27		20.71	2.84	
Gender (female)			73			70
Virgins (coitally inexperienced)			27			21

Although in the current study there were no differences between Intervention groups on the demographic variables at preintervention, given the

previously discussed differences between Sections, the significant correlations between the demographic variables and dependent measures, and research (e.g., Kelly et al., 1989a; Shrum et al., 1989) that indicates the potential relationships between Age, Gender or Virginitly and AIDS Knowledge, Attitudes or Sexual Behaviour, it was decided to control for these three demographic variables in subsequent analyses. This was done in the following manner.

The categorical variables Gender and Virginitly were entered as factors in the analyses for the dependent measures of Knowledge and Attitudes. For Sexual Behaviour, the analyses were performed using only coitally experienced subjects, and so the impact of Virginitly was controlled for by selection. Gender was entered as a factor in the analyses on sexual behaviour. In this way the analyses explicitly tested for the effects of these demographic variables.

The other important demographic variable, Age, was controlled for by selection. The age range was restricted to subjects 18 to 30 years of age. This procedure created a sample with a normally distributed age range. To further investigate the potential impact of Age on the dependent measures, a series of partial correlations were performed between preintervention scores and age, partialling out scores within Intervention by Virginitly by Gender. These correlations indicated that the interactions between Age and the dependent variables were a function of the overlap between Age and Virginitly, and that they disappeared when Virginitly was taken out as a factor. Given these findings, it was decided that Age need not be included as a factor in

subsequent analyses.

Comparison of Intervention and Control Groups on Dependent Variables at Preintervention

The next set of preliminary analyses tested whether there were any significant differences on the dependent measures between groups (i.e., any main effect for Intervention) prior to the AIDS education intervention. One way ANOVAs were performed on the preintervention scores for the dependent variables of Knowledge (AIDS Risk Knowledge Test total score), Attitudes (AIDS Attitude Scale total score), and Sexual Behaviour (composite relative risk score). Table 9 presents the means and standard deviations for Intervention and Control groups.

Table 9

Means and Standard Deviations for Dependent Variables by Experimental Condition

	Intervention Group					Control Group				
	Pre-intervention			Post-intervention		Pre-intervention			Post-intervention	
	<u>N</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Knowledge ^a	388	32.1	(2.3)	34.1	(1.6)	175	32.2	(2.3)	32.6	(2.4)
Attitude ^b	388	219.2	(24.3)	237.9	(19.2)	175	221.8	(24.5)	222.8	(26.2)
Sexual Risk Behaviour ^c	274	1.2	(1.0)	1.1	(0.9)	131	1.1	(0.9)	1.0	(0.9)

^aARKT scores, higher score means higher knowledge; ^bAAS scores, higher score means more tolerant attitudes; ^cRelative risk composite variable for sexual behaviour during the previous three months, higher score means more risky behaviour.

For Knowledge, there were no significant main effects or interactions. This indicates that at preintervention there were no significant difference between Intervention and Control groups, or between males and females or coitally inexperienced and experienced subjects, in the level of AIDS knowledge.

For Attitudes, the main effect for Intervention was not significant, indicating that Intervention and Control groups did not differ at preintervention in their level of tolerant attitudes toward AIDS. There were significant main effects for Gender, $F(1, 532) = 12.01, p < .001$ and Virginitly, $F(1, 532) = 7.79, p < .005$ on the dependent measure of Attitudes at preintervention. An examination of the means in Table 10 indicates that females had more tolerant attitudes than males prior to the intervention, and that coitally experienced participants had more tolerant attitudes than coitally inexperienced participants.

Table 10

AIDS Attitude Scale Preintervention Means by Gender and Virginitly

		AIDS Attitude Scale Score		
		N	M	SD
Gender	Male	155	211.31	26.7
	Female	402	223.41	22.5
Virgins	Yes	136	213.01	24.0
	No	404	221.90	23.9

For Sexual Behaviour, there was no difference between Intervention and Control groups at preintervention, nor any significant main effects or interactions with Gender.

In summary, it was found that when Gender and Virginity were included as factors, there was no main effect for Intervention on any of the dependent measures. This finding indicates that the Intervention and Control groups were equivalent in their AIDS Knowledge, Attitudes and Sexual Behaviour prior to the AIDS education intervention. With the assumption of preintervention group equivalence met, it was appropriate to use analyses of covariance on the postintervention scores to test for the impact of the AIDS education intervention on the dependent variables. Covariance analysis is a powerful test for change between groups over time, and it is the preferred analysis for the type of intervention evaluation addressed in this study (Myers & Well, 1991).

Summary of Preliminary Analyses

In summary, the preliminary analyses were conducted to determine the following. First, the correlations between demographic and dependent variables indicated that select demographic variables should be controlled for. Second, it was determined that it was appropriate to pool across Section, and analyze the impact of the AIDS education by Intervention group. Third, it was determined that the Intervention and Control groups did not differ at preintervention on either demographic variables or on dependent measures. Given these preliminary analyses, it was appropriate to proceed with analyses of covariance on the postintervention scores, controlling for demographic variables, and ignoring the Section by Intervention interaction.

The next set of analyses was performed to address the study

hypotheses. These were the ANCOVAs testing for Intervention effects on the three dependent measures of Knowledge, Attitudes and Sexual Behaviour.

B. Intervention Effects

As discussed in the previous section, the most appropriate and powerful test of the Intervention effects is analysis of covariance on postintervention scores. For Knowledge (AIDS Risk Knowledge Test scores) and Attitudes (AIDS Attitude Scale scores), 2 by 2 by 2 ANCOVAs with Intervention, Gender and Virginity as main effects were performed, using preintervention scores as the covariate. For Sexual Behaviour (composite relative risk score), only coitally experienced subjects were included in the analyses, resulting in a 2 by 2 ANCOVA on postintervention scores with Intervention and Gender as main effects and preintervention scores as the covariate.

Knowledge (AIDS Risk Knowledge Test - ARKT)

To assess whether Intervention group participants differed at postintervention from Control group participants, an ANCOVA was computed using preintervention ARKT scores as the covariate. Following the AIDS education course, the Intervention group participants' test scores were significantly higher than those of the Control group, $F(1, 528) = 72.12, p < .0001$. Mean scores and standard deviations on the AIDS Risk Knowledge Test are presented in Table 9. Inspection of the means in this table indicates that at postintervention the members of the AIDS education intervention group had an average score on the AIDS Risk Knowledge Test that was two points (one

standard deviation) higher than the control group. The Intervention group scores at preintervention were equivalent to those of the control group, and so the 2-point difference at postintervention indicates that the intervention group showed an average increase in AIDS knowledge.

All subjects initially possessed a high level of AIDS knowledge as measured by the ARKT scores at preintervention. There was a limited range of responses on this measure at preintervention; the mean score for the sample as a whole was 32.16 out of a possible total of 36, which meant that it would be difficult to detect an increase in Knowledge. In spite of these restrictions, the F is highly significant, indicating that the students in the Intervention group did gain a measurable level of AIDS knowledge. However, it is important to consider whether a 2-point increase in initially very high levels of Knowledge is meaningful. The first way to investigate this is by calculating effect size. This increase in Knowledge actually represents a medium to large effect size (Cohen, 1992; Rosenthal, 1991). A second consideration is the clinical significance of the results. Examination of the responses to individual items indicates that the gains in Knowledge were seen on items related to specific aspects of HIV transmission (i.e., transmission risk related to donating or receiving blood, mosquito bites, and contact of fluid with unbroken skin) and on an item related to false positive HIV test results.¹¹ These are specific questions, and indicate that the 2-point increase in ARKT scores may have

¹¹ i.e. ARKT items 13, 23, 30, 33, 35, 36 and 40.

questionable clinical significance. It appears that students were already aware of the sexual transmission risk factors at preintervention, indicated by their correct responses to ARKT items that test that type of knowledge. Their Knowledge increase was on items that would likely have little impact on their sexual behaviour. In other words it appears that some test items are more directly related to behaviour, while others are knowledge-based.

Further to this point, it is important to consider that the Intervention group students completed a comprehensive undergraduate course about AIDS, and passed examinations and completed assignments that tested their AIDS knowledge. Although the objective measure of AIDS knowledge employed in this study is an imperfect measure of the amount and domain of their increased knowledge, it is almost certain that the Intervention group students would have differed from the control group students at postintervention on more comprehensive and difficult measures of AIDS knowledge with larger ranges of responses. In short, due to the initially high scores on the ARKT, it was difficult to measure aspects of Knowledge change that might have clinical significance for Attitude and Sexual Behaviour change. However, it is reasonable to assume that students who completed the AIDS education intervention did gain clinically valuable knowledge.

There were no significant main effects for Gender or Virginity on the postintervention scores on this Knowledge measure, illustrating that males and females, coitally experienced and inexperienced participants, did not differ in

their level of AIDS knowledge at postintervention. There were no significant interactions. This indicates that although at preintervention a simple factorial ANOVA indicated a trend toward significance on these factors, with preintervention scores included as a covariate these effects were no longer significant. The Intervention effect alone accounted for the differences in postintervention Knowledge scores.

Follow-up scores. At eight month follow-up, the subgroup of Intervention participants who completed the measures for a third time maintained the increase in Knowledge that they showed immediately postintervention. As seen in Table 11, mean ARKT scores remained the same from postintervention to follow-up. A *t*-test confirmed no significant difference between the two means. As discussed in the Methods section, this small subgroup of participants seems to be a representative sample of the larger group. However, given the small sample, and the possible bias introduced by self-selection, the maintenance of change at eight months postintervention is more suggestive than conclusive.

Table 11

Postintervention and Follow-up Scores for Intervention Subgroup

	Post-intervention		Follow-up	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
<u>n=70</u>				
Knowledge	34.17	1.64	34.23	1.68
Attitudes	237.91	19.27	237.68	18.93
<u>n=47</u>				
Sexual Behaviour	1.12	0.97	1.15	1.03

Attitudes (AIDS Attitude Scale - AAS)

The effect of the AIDS education intervention on Attitudes, as measured by the total score on the AIDS Attitude Scale at postintervention, was tested by an Intervention by Gender by Virginity ANCOVA with preintervention scores as the covariate. There was a significant difference between groups in Attitudes following the AIDS education course, $F(1, 523) = 114.73, p < .0001$. Mean scores and standard deviations on the AIDS Attitude Scale are presented in Table 9. Inspection of the means in this table indicates that at postintervention the Intervention group participants had an average score on the AIDS Attitude Scale that was 15 points higher than the control group (representing a medium to large effect size). The Intervention group scores at preintervention were equivalent to those of the Control group, and so the difference at postintervention indicates that the Intervention group showed an increase in their positive or tolerant attitudes toward AIDS and persons with AIDS.

As noted earlier, preliminary analyses and previous research indicated that it was important to explore Gender differences in Attitudes. There was a trend toward significance for the Gender main effect, $F(1, 523) = 3.01, p = .08$. Female students reported more tolerant attitudes at postintervention ($M = 227.87$) than did males ($M = 224.93$). This sex difference has been reported in the literature (e.g., Green et al., 1993). Gender did not interact significantly with Intervention, which indicates that females were no more likely than males to report changes in Attitudes following the AIDS education intervention.

The Gender by Virginty interaction also showed a trend toward significance, $F(1, 523) = 3.84, p = .053$. Table 12 presents the Gender by Virginty means for all subjects on the AIDS Attiude Scale. An examination of this Table indicates that the interaction seems to occur because females, particularly those who were coitally experienced, had more tolerant attitudes (higher scores) than males. Coitally experienced females reported more tolerant attitudes than coitally inexperienced females. However, males who were coitally experienced reported the same attitudes as males who were virgins. For females only, sexual experience seemed related to increased tolerance.

Table 12

AIDS Attitude Scale Adjusted Postintervention Means for Virginty by Gender

	Virginty	
	Yes	No
Gender		
Female	231.55 (100)	239.12 (287)
Male	224.27 (36)	224.53 (109)

Note. The preintervention score is partialled out of the postintervention score. Values in brackets refer to number of cases in that cell.

Follow-up scores. At eight months follow-up, the Intervention participants who completed the measures maintained the increase in AAS scores they had reported immediately postintervention. Table 11 presents the mean scores at postintervention and follow-up. A t -test confirmed no significant difference between the two means.

Self-reports of change. At postintervention, AIDS education intervention group students were asked about their attitudes toward homosexuality.¹² A total of 386 participants responded to this question. Seventy percent of the students claimed to have altered their attitudes. Of these, 87% ($n = 213$) reported large changes in their attitudes toward homosexuality in a positive, more tolerant direction. A further 10% reported a moderate change in attitudes in a positive direction, but also some continued homophobia or negative attitudes. Only one participant reported becoming more homophobic. Of the 30% of students who reported no change in their attitudes, 91% ($n = 93$) reported that they had held positive or tolerant attitudes toward homosexuality previous to taking the course, and that these positive attitudes had remained unchanged. A further 8% of these students reported no change from previously homophobic or negative attitudes. Table 13 shows illustrative comments in response to the question.

Taken together, these frequency data indicate that 97% of the AIDS education intervention participants reported positive attitudes toward homosexuality immediately following the intervention. A very large proportion of students reported that this shift (that they attributed to the course) represented a change from previously held negative attitudes. A significant minority of

¹² The following question was completed by the Intervention group participants only: have your attitudes towards homosexuality changed as a result of taking Psychology 106? Please explain.

Table 13

"Have your Attitudes towards Homosexuality changed as a result of taking Psychology 106?" Sample "Yes" Responses (70%).

Yes, definitely. In the past I could not understand homosexuality and I always thought that it was because there was something psychologically wrong with a person if they were a homosexual. I now know that I was wrong and I have to learn to stop judging people in the context of my own experience. It is hard to change overnight, I do not know many homosexuals (that I know of) but I hope in time I can change enough to the point where sexuality isn't even an issue.

I've learned about heterosexism and how our society promotes it. I've learned that we can't judge anyone. I try my best not to be homophobic.

I stayed away from a tutorial because I was afraid of having to walk down the halls holding another woman's hand. Now I would do the exercise assertively because I believe that the social attitudes toward homosexuality must be challenged.

Plain and simple: I am no longer so ignorant! I saw things from the other side.

I am more knowledgeable, compassionate, aware, less ignorant.

I think the thought of sexuality on a continuum shows that homosexuality is not "a problem".

I went from being tolerant of homosexuality to accepting it.

Meeting homosexual people brought homosexuality closer to me - I can't say I don't know anything about it or I've never met a gay person. The course has exposed me to issues I had never considered.

Definitely - I remember not being too sure of homosexuality the first time I took this quiz. Now I feel very comfortable, especially knowing that they are not to blame for AIDS and that you cannot catch it from casual contact.

I am still not 100% comfortable with homosexuality but I'm definitely getting there. Just talking about it and hearing about it changed my perspective, I think for the better.

I still believe that it is Biblically wrong (that is out of my hands) but I think I will be much less homophobic. I can see no justification for homophobia.

Table 13 (continued)

"Have your Attitudes towards Homosexuality changed as a result of taking Psychology 106?" Sample "No" Responses (30%)

I have always been made aware by my mom that what people do in their bedrooms has nothing to do with whether or not I should like that person, and should not affect my judgement of them.

Not my attitudes, which were already positive, but maybe my awareness of what it would be like to be homosexual and my awareness of the discrimination and stigma they face. But I've always had an "open" or "good" attitude towards homosexuality.

I acknowledge that people can be homosexual. I don't think it is genetic. I think it is learned. I also don't think it is normal behaviour. I do think they are a risk group. The term risk behaviour seems to be the same as risk group behaviour.

students reported that they started the course with tolerant or positive attitudes, which were maintained. Only 3% of students reported maintaining previously held homophobic or negative attitudes or experiencing less tolerance following the course.

These self-report data lend support to the results of the ANCOVA on AAS scores. Both findings indicate a statistically and likely clinically significant change in attitudes toward AIDS, PWAs, and homosexuality. As discussed in Chapter 1, young heterosexuals tend to have negative attitudes toward homosexuality and AIDS which may influence their own participation in risky sexual behaviour. This study showed that Intervention group participants reported more positive or tolerant attitudes following the course, and this attitude change may increase the likelihood of them changing their own sexual

behaviour.

Sexual Risk Behaviour During Three-month Retrospective Periods

The analyses on the Sexual Behaviour variables were performed using only coitally experienced subjects. In this manner sexual experience was controlled for by selection.

1. Composite relative risk behaviour score. A 2 (Intervention) by 2 (Gender) ANCOVA was computed on the composite relative risk behaviour variable, using preintervention scores as the covariate. Table 9 presents the means and standard deviations for Intervention and Control group participants at preintervention and postintervention. It is noteworthy that both initial and postintervention reports indicated a low level of sexual risk behaviour for all subjects (the range of possible scores on the relative risk index is from 0 to 4).

The main effect for Intervention was not significant. This means there was no difference in self-reported sexual risk behaviour, as measured by this composite variable, between Intervention group and Control group participants at postintervention.

There was a significant main effect for Gender for the sexual behaviour measure, $F(1, 357) = 6.22, p < .05$. Females received higher scores on the composite sexual risk behaviour variable ($M = 1.16, n = 261$) than did males ($M = 0.88, n = 101$). A possible explanation for this is that males in this sample tended to be older, and may be more likely to be in a monogamous relationship. As number of sexual partners is one component of the relative risk

index, this could explain the Gender effect.

There was also a trend toward significance on the Gender by Intervention interaction, $F(1, 357) = 3.51, p = .062$. Table 14 presents the means by Gender and Intervention group. An examination of these means indicates that women in both groups had higher sexual risk scores than did men. There were no differences in sexual risk behaviour scores between Intervention and Control group women; however, men in the Intervention group had higher reported risk than men in the Control group at postintervention.

Table 14

Sexual Risk Behaviour^a Adjusted Postintervention Means by Intervention and Gender

	Intervention	Control
Gender		
Female	1.15 (177)	1.19 (84)
Male	1.00 (69)	0.63 (32)

Note. The preintervention score is partialled out of the postintervention score; Values in brackets refer to number of cases in that cell.

^a Relative risk index composite sexual behaviour score.

2. Follow-up scores. At eight months follow-up, there was no significant change in the sexual risk behaviour score for the subgroup of intervention subjects who responded to the questionnaire. As seen in Table 11, Intervention group participants' scores remained the same from postintervention to follow-up. A t -test confirmed this.

3. Composite relative risk behaviour score for high-risk subjects. In order to further explore whether the AIDS education intervention had an impact on sexual behaviour, an ANCOVA was performed selecting only those subjects who reported a higher level of sexual risk behaviour at preintervention.¹³ It was proposed that if there were a measurable decrease in sexual risk behaviour, it would be more readily observed in subjects who reported an initial level of risk behaviour that would allow enough variance for a decrease to occur. The ANCOVA was not significant, $F(1, 136) = 3.02, p = .085$.

For Intervention group participants, there was a reduction in their mean relative risk score from 2.26 ($SD = .68$) at preintervention to 1.77 ($SD = .69$) at postintervention. Control group participants also showed a decrease (preintervention $M = 2.04, SD = .27$ and postintervention $M = 1.80, SD = .63$), but it was only half the size. So even though the difference between Intervention and Control students at postintervention was negligible, the AIDS education did appear to influence high-risk students' sexual behaviour in a clinically meaningful way, in that their mean relative risk did decrease.

4. Individual components of relative risk behaviour score. As summarized above, there was no significant difference in sexual risk behaviour between intervention group participants and control group participants at postintervention (as measured by the relative risk index) either for the sample as a whole or for those subjects with initially higher levels of sexual risk

¹³ Preintervention composite relative risk index ≥ 2 ($n=147$).

behaviour. As described in the Methods section, the relative risk index is comprised of the number of sexual partners, frequency of vaginal intercourse, and percent of condom use reported by participants for the previous three months. In order to further explore sexual risk behaviour reported at preintervention and postintervention, it was decided to do supplementary analyses on the three components of the relative risk index. Means and frequencies by Intervention group for these sexual behaviour variables are presented in Table 15 for all sexually active participants, and in Table 16 for high-risk participants.

First, consider the findings for all sexually active participants. For the three variables that made up the relative risk index, ANCOVAs were calculated using preintervention scores as covariates. There were no significant differences between the Intervention group participants and the Control group participants at postintervention for the number of sexual partners or percentage of condom use during vaginal intercourse during the preceding three months. However, there was a significant main effect for Intervention at postintervention for frequency of vaginal intercourse,¹⁴ $F(1, 266) = 4.33, p < .05$. Examination of the means in Table 15 indicate that Intervention subjects were engaging in more episodes of vaginal intercourse at postintervention compared to Control group subjects. This difference in postintervention means (3.5 episodes of vaginal intercourse) represents a small effect size; this can be interpreted as a

¹⁴ Log transformed value

Table 15

Sexual Risk Behaviour Variables by Experimental Condition for All Subjects

	Intervention (N=274)				Control Group (N=131)			
	Pre-intervention		Post-intervention		Pre-intervention		Post-intervention	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Relative risk index (%)								
0	31		31		39		42	
1	32		30		16		16	
2	32		38		43		40	
4	05		02		01		02	
Frequency of vaginal intercourse	17.93	(21.95)	18.71	(24.88)	16.92	(18.55)	15.22	(17.86)
Frequency of unprotected sex	13.22	(20.67)	13.93	(24.75)	13.01	(18.07)	12.57	(18.26)
Percentage of condom use for vaginal intercourse (%)	34	(42)	37	(48)	37	(46)	31	(44)
Condom vaginal intercourse (%)								
0	55		47		52		58	
1-49	09		14		10		11	
50-99	26		25		26		22	
100	09		14		11		07	
Frequency recode (%)								
no (0)	30		30		14		20	
low (1-10)	36		34		79		70	
high (>10)	34		35		06		10	
Number of partners	1.01	(.73)	1.07	(.76)	0.92	(.52)	1.06	(.87)
Partners recode (%)								
no (0)	17		15		14		20	
low (1-2)	73		75		79		70	
high (≥ 2)	11		09		06		10	
Ever condom (% yes)	91				95			
Condom recent intercourse (% yes)	38		45		38		40	
Condom next intercourse (% yes)	52		60		51		51	
Condom next intercourse with a new partner (% yes)	98		99		99		98	
HIV test (% yes)	18		19		22		28	

Table 16

Sexual Risk Behaviour Variables by Experimental Condition for High-Risk Subjects

	Intervention (n=91)				Control Group (n=56)			
	Pre-intervention		Post-intervention		Pre-intervention		Post-intervention	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Relative risk index (%)								
0	00		04		00		06	
1	00		21		00		12	
2	87		71		98		80	
4	13		03		02		02	
Frequency of vaginal intercourse	34.55 (21.37)		28.71 (21.78)		29.20 (17.23)		28.56 (20.62)	
Frequency of unprotected sex	32.66 (23.63)		27.49 (33.62)		28.01 (17.93)		26.02 (19.98)	
Percentage of condom use for vaginal intercourse (%)	12	(26)	17	(32)	06	(19)	08	(22)
Condom vaginal intercourse (%)								
0	75		67		80		79	
1-49	15		18		13		13	
50-99	10		13		07		04	
100	00		02		00		04	
Frequency recode (%)								
No (0)	0		05		00		06	
Low (1-10)	10		30		05		20	
High (>10)	90		66		95		74	
Number of partners	1.43	(.95)	1.16	(1.41)	1.17	(.57)	1.22	(.69)
Partners recode (%)								
no (0)	0		02		00		02	
low (1-2)	77		85		93		85	
high (≥ 2)	23		13		07		13	
Ever condom (% yes)	87				91			
Condom recent intercourse (% yes)	11		21		05		08	
Condom next intercourse (% yes)	13		33		11		17	
Condom next intercourse with a new partner (% yes)	97		99		98		98	
HIV test (% yes)	22		26		34		37	

small but not trivial effect (Cohen, 1992). This finding seems to imply an increase in sexual behaviour in AIDS education intervention students in the opposite direction from that predicted by the experimental hypotheses. However, the meaning of this difference in terms of actual sexual risk is unclear. Simply knowing the frequency of vaginal intercourse, without considering the percentage of occasions on which condoms were used, does not give enough information about sexual risk. For example, the Intervention group students may have been participating in more frequent vaginal intercourse, but if they were using condoms 100% of the time, this would not necessarily imply that their HIV transmission risk was higher than that of the Control group students. Another point worth considering; it is possible that the frank discussions and education about sexuality had a disinhibiting effect on course participants, and that these students increased their level of sexual activity in response to the course.

As for other sexual behaviour variables, Table 15 indicates that clinically meaningful trends toward safer sexual behaviour were reported by intervention participants. There were small increases in condom use for intervention group participants, with more students reporting always using condoms and fewer reporting never using condoms. The trend was reversed in control group participants.

Second, Table 16 presents means and percentages for sexual behaviour variables for those subjects with higher initial levels of sexual risk behaviour. Inspection of this table indicates some clinically interesting differences at

postintervention between Intervention and Control group participants. For example, 13% of Intervention participants had initial relative risk index scores of 4, indicating that they were high-risk. Postintervention, this decreased to 3%. Absolute values of the frequency of vaginal intercourse and unprotected sex also decreased following the AIDS education course, yet remained the same for control group participants.

5. Reported condom use. The next set of supplementary analyses was performed to examine the percentage of Intervention and Control group participants who reported actual condom use in their most recent intercourse, and anticipated condom use in their next intercourse (see Table 15). Prior to the intervention, only 38% of subjects in both groups reported having used a condom in their most recent intercourse. Following the AIDS education intervention, Intervention group participants increased their condom use by 7%, whereas the Control group subjects showed a 2% increase. Reported intention to use a condom in the next intercourse also increased, in the Intervention group only, from 52% to 60%. While chi square analyses of these differences were not significant, these findings do suggest a clinically meaningful increase in both actual and intended condom use in the Intervention group only.

Table 16 indicates even greater changes for high-risk subjects. There was an increase by 10% of intervention participants who had used a condom in their most recent intercourse (compared to a 3% increase for control group participants) and a 20% increase in the intention to use a condom

in the next intercourse (compared to a 2% increase for the control group).

6. Self-reports of change. As with Attitudes, at postintervention, AIDS education group respondents were asked about changes in their sexual behaviour in response to the AIDS education course.¹⁵ Claims to have altered their behaviour were made by 40% of the participants ($n = 147$). Of these, 54% reported an increase in the frequency of condom use. A further 36% reported the intention to change future behaviour, mainly by using condoms with a new sexual partner. Six percent reported some other change in risk behaviour, including choosing celibacy and reducing the number of partners. However, 60% ($n = 223$) of students reported no change in their sexual risk behaviour. Of these, the large majority (87%) stated that their previous sexual behaviour had been low-risk (either they were not sexually active prior to the course or they were involved in what they considered to be a monogamous, low-risk sexual relationship) and therefore their behaviour had not changed in response to the course. Many of these students did report that they intended to use condoms if they were to become sexually active or have a new sexual partner in the future. Given the objective data, which reveals relatively low initial levels of unsafe sexual behaviour and thus little need for sexual behaviour change, it seems likely that most respondents' self-reports match their actual behaviour. Table 17

¹⁵ The following questions were asked. A) Have you changed your own risk behaviour (i.e., sexual behaviour) as a result of taking Psychology 106? Please explain. B) What aspects of the course, if any, caused you to change, or consider changing, your risk behaviour? C) Do you have any suggestions on how to make Psychology 106 more effective in causing students to change their risk behaviour?

presents a sample of participants' comments in this regard.

Table 17

"Have you Changed your own Risk Behaviour (i.e., sexual behaviour) as a result of taking Psychology 106?" Sample "Yes" Responses (40%).

Condoms have become part of the "date kit"; I don't expect to use it but be prepared.

100% condom use.

Less apt to sleep with someone if I don't know their sexual history, less apt to have sex with anyone in general unless it is a monogamous relationship. Definitely more cautious and scared.

I haven't had any sexual behaviour since the course started, but I will definitely take the necessary precautions next time.

Not only have I insisted on my exclusive relationship with my boyfriend in which we always use condoms, I have decided that any future relationships will not be sexual until we both have HIV antibody tests.

I have learned that "not me" scenarios do not keep an STD from affecting you. Although presently sexually inactive, I know that from the present on I have the knowledge and want to participate in safer sex.

Sample "No" Responses (60%).

I have learned more about risk behaviour, however I am still of the mind set that I'm in a monogamous relationship with a trusting partner and I've not changed me behaviour, although my partner and I are discussing it more openly.

I have one partner only - we are both momogamous. I have had protected sex all my life and he was a virgin before we got together.

Have not changed behaviour with current partner but would if had a new partner.

I fully intend to be more safe, but in the moment, I'm not so smart.

Of the participants (60%, $n = 229$) who responded to the second question concerning what aspects of the course influenced sexual behaviour change or intentions to change, the most frequently cited reason (by 50% of responders) was realizing their own vulnerability, in terms of the risk of heterosexual HIV transmission. A further 19% of respondents cited an increase in knowledge about HIV/AIDS in general as a cause of behaviour change, and 14% reported that meeting the panel and seeing the impact of HIV on peoples' lives impacted them. Other influential aspects that were reported included the instructions in condom use, particularly the emphasis on sexual pleasure; the personal impact of the instructor; fear; and combinations of these factors. Table 18 presents a sample of comments.

Table 18

"What Aspects of the Course, if any, caused you to Change, or consider Changing, your Risk Behavior?" Sample Responses.

That heterosexuals are at risk to get AIDS as much as other groups.

Transmission through heterosexual contact.

Everything about this course has opened my eyes to AIDS. I have told everyone I know about it.

Realizing I could make use of condoms fun and pleasurable for the male and insisting the male take responsibility and show respect for me.

Learning about risk behaviour, safer sex and hearing things that happen to PWAs and giving out condoms.

Hearing the PWA panel, seeing/hearing the implications, the reality of the disease. The panel opened my eyes because they were real people, not statistics or examples given in lectures or readings.

In an effort to generate ideas for how to improve the AIDS education course in the future, students were asked for their suggestions. Fifty-one percent of subjects ($n=197$) responded. Half of these stated that the course was excellent the way it was, and that no changes were needed. The second most frequent response (18%) was a suggestion that the AIDS panel include heterosexual HIV positive youth. Other suggestions were for increasing the amount of contact with HIV positive persons through speakers, videos and panels (16%); providing more condom and sex education, making HIV tests available, increasing tutorial length to two hours, having students invite a friend to a lecture to "spread the word", and teaching abstinence rather than safer sex (combined responses 15%). Table 19 presents a sample of these suggestions.

Summary of Sexual Behaviour Change

Overall, there were no significant differences between the Intervention group and Control group participants at postintervention on the relative risk index for sexually active subjects or high-risk subjects. The AIDS education did not lead to statistically significant increases in condom use during vaginal sex or decreases in the number of sexual partners. Initial levels of these risk behaviours were quite low, which left little room for statistically measurable changes. However, there were some clinically meaningful changes toward safer sexual activity for the intervention group participants only. For example, there was an 7% increase in the number of participants who reported using a condom in their most recent intercourse. The subgroup of students who

Table 19

"Do you have any Suggestions on how to make Psychology 106 more Effective in causing students to Change their Risk Behaviour?"

No! Pat and the teaching assistants are doing an excellent job.

No way! It's an awesome course, I wouldn't suggest anything.

I thought it was an excellent course taught by a straightforward, explicit, excellent teacher.

The course is very effective already, because it allows you to personalize the issues of HIV, AIDS, homophobia, women and AIDS, etc. so that you can look at them in terms of your own life.

When bringing a PWA to class for discussion maybe you could bring someone who is of average college student's age, so we can see their perspective.

No, except maybe more statistics of younger AIDS patients or articles about some who have contracted it through heterosexual contact. Maybe meet someone our age who has it.

Continue the panel discussions, they made the AIDS virus seem more real and human.

Providing condoms was a great idea, and a fun class, too.

Perhaps info on the best condoms (thinnest) etc.

I would say after what we have learned, anyone still committing risk behaviour probably will continue. The amounts of knowledge and realities we have learned should scare a condom on anyone.

I think in the end, each individual must choose. Because we have a lot more choices now, we know about the consequences of our behaviour. Education is a powerful weapon, but so is experience.

reported a high level of relative sexual risk at preintervention had lower scores on the relative risk index following the course, and fewer episodes of unprotected vaginal intercourse. There was also a 10% increase in the number of these high-risk participants who used a condom in their most recent intercourse, and a 20% increase in the number reporting the intention to use a condom in the next intercourse.

On self-report, 40% of all sexually active students in the intervention group reported having changed their sexual behaviour as a result of the AIDS education course. Most of the other 60% of students reported either that they were not currently sexually active, or that they had only one sexual partner whom they considered to be low-risk. Many of them did indicate that they intended to use condoms if they were sexually active in the future with a new partner.

Exploratory Analyses of Teaching Assistants

Finally, the self-report data were examined to compare reported attitude or sexual behaviour changes between students who had different teaching assistants (there were four teaching assistants and students had one of them, or the course professor, as their tutorial teacher). Chi square analyses indicated that there were no differences in the proportion of students who reported positive, negative, or no changes in their attitudes or sexual behaviour. These findings imply that the course material was influential across the teaching staff employed in the present study, and suggests that other teaching staff should

be able to achieve similar changes.

Summary of Intervention Effects

The intervention was successful in producing significant increases in AIDS knowledge and more tolerant attitudes, as measured by the AIDS Risk Knowledge Test and the AIDS Attitude Scale. Knowledge increases were also suggested by the students' completion of the requirements of an undergraduate course, and the measured attitude changes were supported by students' self-reports. The course did not produce statistically significant changes in sexual risk behaviour, as measured by the relative risk index. However, clinically significant increases in condom use and the intention to use condoms were reported, particularly by participants who had high-risk sexual behaviour at preintervention.

CHAPTER 4: DISCUSSION

In this final chapter, I will discuss the findings of the present study in light of previous theory and research. As I have already discussed many aspects of the findings in the previous chapter, I will focus on the implications of the findings for future AIDS education courses, program evaluation, and theory.

A. Intervention Effects

The primary purpose of this study was to investigate the impact of an undergraduate AIDS education course on students' AIDS knowledge, attitudes, and sexual behaviour. Was the AIDS education intervention successful in increasing knowledge, promoting more tolerant attitudes, and decreasing risky sexual behaviour in heterosexual university students?

Knowledge

The AIDS education intervention taught as a psychology course to undergraduate students did increase the participants' AIDS knowledge. The intervention group students had postintervention scores that were significantly higher than those of students who did not take the course. In addition, students in the AIDS education course passed examinations and assignments which demanded a high level of knowledge, which indicates that they learned the course content. These outcomes support the conclusion that participants gained practical, or ecologically valid, AIDS knowledge.

The increases in knowledge imply that the current course was taught in a manner, and contained the necessary material, to transmit information to

students that should allow them to understand the biological aspects of HIV transmission, identify risky behaviours, and understand AIDS and HIV in psychological and social contexts. In other words, the results indicate that students who took the course were, upon completion, in possession of both the knowledge to evaluate their own sexual (and other) risk behaviours, and the knowledge and skills to make appropriate changes toward safer behaviour if they determined that they were currently putting themselves at risk. So in terms of knowledge, the course was a success.

It should be noted that these conclusions are based on the inference that broad-based and thorough AIDS knowledge was gained, as indicated by the students' successful completion of the undergraduate course (i.e., passing the required examinations and assignments) in addition to the previously discussed statistically significant increase in AIDS Risk Knowledge Test scores. While the ARKT appears to be a good measure of basic AIDS knowledge, the most important contribution it made to the current research was to show that students entered the course with a surprisingly high level of AIDS knowledge. The ARKT scores appear to be a valid and useful marker of initial knowledge. However, in the future, comprehensive objective measures of AIDS knowledge that have more variance and greater sensitivity to clinically meaningful AIDS knowledge (that is, knowledge that seems to influence attitude or behaviour change) should be used in addition to the ARKT. It is also crucial that measures of AIDS knowledge be sensitive to measuring changes in knowledge.

Phillips (1993) makes the point that both subjective and objective AIDS knowledge should be measured in evaluation research. He found that objective AIDS knowledge was only moderately correlated with subjective knowledge ("how much do you think you know about AIDS?") and that subjective knowledge was more strongly associated with the outcome variable of seeking voluntary HIV testing. While the current study measured only objective AIDS knowledge with a simple questionnaire, and inferred complex knowledge acquisition based on the completion of an university course, subjective ratings of knowledge were not directly obtained. However, many students made comments in response to the self-report questions that asked what aspects of the course were effective that they had acquired a great deal of factual knowledge from the course.

In summary, the current study shows that the AIDS education intervention successfully increased participants' AIDS knowledge. It seems that students made both statistically and clinically significant gains in knowledge which were measured by the objective AIDS Risk Knowledge Test, implied by the successful completion of university-level course requirements, and spontaneously mentioned in self-reports.

Attitudes

The hypothesis that AIDS education course participants would show more tolerant attitudes following the intervention was supported by both objective measures and students' self-reports. There were significant increases

in AIDS Attitude Scale scores for experimental subjects at postintervention. In addition, the majority of students reported that their attitudes toward homosexuality had changed as a result of the course, and participants stated that these changes resulted in increased tolerance toward and acceptance of homosexuality.

As a teaching assistant for the course, I was initially struck by the essays that students wrote for an assignment that the professor defined as a "reaction paper." Students were instructed to write a short essay about some aspect of the course that aroused a reaction in them. When reading these papers I noted the large proportion that focused on the writers' attitude change. Many students stated that they came from small towns, or family or cultural backgrounds where there was overt or covert homophobia. Many wrote that Psychology 106 was the first forum in which they had heard about and participated in frank discussions of human sexual behaviour, and particularly the continuum of sexual orientation. For many, meeting the AIDS panel and members of the teaching staff who were self-identified as gay, lesbian or bisexual was a unique experience. Most of the students who wrote about this aspect of their experience in the course reported large changes in their previous homophobic attitudes; changes that they attributed to the course content related to homosexuality.

It is important to note that this course was not neutral in its content. The professor and teaching assistants stated their personal beliefs and opinions,

and explicitly noted their biases. The course was taught from a "gay positive" perspective, and it was clear to students that the teaching staff were personally opposed to homophobia and discrimination against persons with AIDS or HIV, or other marginalized persons. The impact of these views on students, in addition to the course content that dealt with issues of discrimination, social and biological theories of homosexuality, and human sexuality in general, were not expressly measured in the current study. Therefore, it is not possible to determine what aspects of the present AIDS intervention were responsible for the large attitude change that was observed. However, students' self-reports did identify that meeting homosexual panel members, and being taught about societal and institutional homophobia, were important factors in the reevaluation and modification of their previously held attitudes.

These changes raise the question of the potential impact of the course if it were taught from a neutral standpoint, or, for that matter, from a "gay negative" or homophobic point of view. For the first question, it would be useful to present the course material in a neutral manner and compare the subsequent impact on attitudes to the attitude changes observed when the course is presented from a gay positive perspective. I would suggest that the attitude changes would still be seen, although they might be smaller in magnitude, or observed in a smaller proportion of students. I do feel that the personal convictions of the teaching staff had some impact on the students, above and beyond the course material. However, many of the readings on

homosexuality, marginalization, and homophobia were in and of themselves powerful and thought provoking. The facts of oppression and discrimination have their own emotional impact, separate from the views of the person presenting them, and I believe the material itself, combined with meeting the AIDS panel, would still have created significant attitude changes in the students even without the current teaching staff. In this way, I believe the course is "portable," and that it would be effective in changing attitudes even when presented by different, and potentially neutral teaching staff.

Although in my opinion the second of these questions raises many ethical and moral issues, it is not impossible to imagine the religious or political right teaching from a homophobic perspective. While teaching that heterosexual activity, within the bounds of marriage, is the only acceptable form of sexual activity may be philosophically appropriate to some portion of the North American population, these teachings have not been shown to be effective in preventing risky sexual contact, heterosexual or otherwise, in young people. I suggest that these teachings reinforce the concept of HIV infection as a problem of the other, and thus could contribute to the ongoing health care problem of young people engaging in unprotected sexual contact.

In summary, the AIDS education course successfully changed attitudes toward AIDS, HIV, and homosexuality, creating more tolerant and accepting attitudes in course participants. As reported in Chapter 1, previous research and theoretical models of health behaviour, as well as findings from cognitive

psychologists relating to biases in decision making, highlight the importance of achieving attitude change as a step toward actual behaviour change. This study was successful at changing attitudes, and according to student reports, also successful at breaking down the categories of self (e.g., young heterosexual, not at risk for HIV) and other (e.g., homosexual male, at risk for HIV, "not me"). Likely, this in turn influenced perceived susceptibility for HIV infection. The implications for future AIDS education programs with this population include the importance of targetting perceived susceptibility as a mechanism for change, and the importance of proximity to persons with HIV or AIDS for attitude and hopefully behaviour change (e.g., Kaemingk & Bootzin, 1990).

Sexual Behaviour

The hypothesis that sexual risk behaviour would decrease following the AIDS education course was not fully supported by this study. Students who took the AIDS course did not report statistically significant decreases in sexual risk activity as measured by the composite risk variable derived from the Risk Behaviour Survey. However, there were clinically significant changes, for AIDS course participants only, toward more frequent condom use and the intention to use condoms with future (i.e., new) sexual partners. These changes were more noticeable for students who, at preintervention, had higher levels of sexual risk behaviour. In addition, as detailed in the Results section, the majority of AIDS course participants on subjective self-report stated either that they had decreased their sexual risk behaviour, or that they had not changed their

behaviour because their initial behaviour was low- or no-risk. Most of the sample reported intentions to be safer in the future, particularly with new sexual partners.

Despite the clinically significant changes in reported sexual risk behaviour, on objective measures there were no statistically significant changes in sexual behaviour following the AIDS education course. What might explain these findings? First, the initial level of perceived sexual risk in this sample was low. Students widely reported involvement in monogamous relationships with sexual partners whom they did not perceive to present an HIV transmission risk. Therefore, they reported that they did not feel it was necessary to use condoms consistently, particularly if they were using other methods of birth control. It is worth noting that while the youth in this study generally participated in sexual activity with one regular partner, the reported incidence of unprotected vaginal intercourse with that regular partner was quite high at both times of testing. Again, it appears that students did not perceive the need to change their existing sexual practices, although they did often indicate the intention to change their behaviour in the future.

Second, the actual level of sexual risk behaviour, as measured by the RBS, was low, which supports the validity of the students' perceptions of low-risk. Most of the participants had one sexual partner, which resulted in a low sexual risk score even if students participated in unprotected vaginal intercourse with that partner. In addition, the overall incidence of either

protected or unprotected intercourse was low. This low level of sexual risk at preintervention made it less likely that statistically significant decreases in risk scores would be detected.

Third, students reported that the course changed their perceived vulnerability to HIV infection. After the intervention, they did acknowledge the reality of heterosexual transmission risk. This prompted them to intend to use condoms with future partners; however, the majority did not choose to change their sexual behaviour with their current steady partner.

So although there was no measurable change in sexual risk behaviour, the differences that were observed on objective and subjective measures indicate that the trends toward change were in the predicted direction. Sexual behaviour changes are likely to be slow and incremental, rather than all-or-nothing. The changes toward more frequent condom use with present partners and intentions to use condoms with future partners are therefore, in my opinion, clinically significant and encouraging. However, there are two points which temper this sense of encouragement. First, even students who had preintervention sexual behaviour that put them in a higher risk category (more than one sexual partner, frequent unprotected vaginal intercourse) did not report a statistically significant decrease in sexual risk behaviours as measured by the relative risk index (these findings are discussed in the Results chapter). Second, while the clinically significant changes and trends to statistically significant change were in the desired direction (toward more frequent condom

use, condom use with new sexual partners, etc.), previous research has indicated that making consistent, long term changes in sexual behaviour is very difficult, and recidivism is high. Future research with this population should further explore this by (1) focusing on risk reduction in the proportion of students who do engage in high levels of sexual risk behaviour, (2) using more sophisticated measures of sexual behaviour, and (3) following up on students' reported intentions to use condoms with new sexual partners.

The results of this study support the findings reported by other researchers; namely, that it is very difficult to change sexual behaviour. People do not want to accept an actual loss in the present (pleasurable sexual contact) in exchange for possible future gains (preventing HIV infection). The actual loss is experienced as more salient in decision making, and the highly motivated and rewarding current behaviour is very difficult to get people to change. This choice pattern indicates that AIDS prevention programs should present condoms and teach other safer sex behaviours as sexually pleasureable, positive additions to the sexual repertoire.

In addition, it is difficult for people to change their behaviour if they cannot picture what the future outcomes will be. Specifically, seeing the terrible ravages of HIV illness will give students tangible representations about the future, undesirable, possible outcome of their present actions. In the current research, the AIDS panel allowed students to meet and interact with people who were experiencing the consequences of previous behaviour choices. This

was an important aspect of the course. Students suggested that having AIDS panel members with whom they could identify even more closely (i.e., young heterosexuals) would have an even greater impact on them. Presumably this identification would work at the level just mentioned, and allow students to picture and empathize with the potential future consequences of risky sexual activity and possible HIV infection.

The ineffectiveness of many AIDS education programs in creating behaviour change, and the high recidivism found in participants who do initially change their behaviour, is very discouraging. However, in their article So what if the program ain't perfect?, Kaplan and Abramson (1989) develop a mathematical model of AIDS education which shows that even imperfect programs that create some increase in condom use or decrease the number of sexual partners will reduce HIV transmission significantly over time. They emphasize the following two points: first, programs can reduce the number of people who get new infections by changing the behaviour of uninfected persons so they do not put themselves at risk and second, programs can minimize the spread from HIV infected people by helping them discontinue their risky behaviour. Kaplan and Abramson suggest that we must reconceptualize the criteria for judging the efficacy of AIDS education programs, and realize that even if a program looks like a failure on current, objective measures it may be quite successful in the long term reduction of new HIV infections.

This assertion supports my contention that the present program did

create clinically meaningful changes in sexual behaviour. To start with, at preintervention, the frequency of condom use was low. Only 9% of AIDS intervention participants reported using condoms 100% of the time. This rate increased to 14% following the course. There was a 7% increase in the percent of subjects reporting having used a condom in their most recent intercourse and an 8% increase in subjects intending to use a condom in their next intercourse, and these numbers increased to 10% and 20% when the high-risk subgroup was examined. As emphasized in the previous paragraph, and by the theory of meta-analysis (Rosenthal, 1991), even these small changes in condom use can make significant changes in future mortality from AIDS.

Summary of Intervention Effects

Taken as a whole, the present study was successful in increasing the AIDS knowledge of course participants, and providing them with the necessary information to evaluate their own sexual behaviour and make informed decisions about their level of risk for HIV transmission. The undergraduate course introduced students to the biological, psychological, and social aspects of AIDS and HIV. The course also made a significant impact on students' attitudes toward AIDS and HIV infected persons, causing students to become less homophobic and more tolerant toward AIDS, homosexuality, and related issues. In this way, the intervention was successful at obtaining what have been called intermediate results (Wong-Rieger & David, 1993), or the changes in knowledge and attitudes that are considered to be necessary steps in the

process of behaviour change. These significant changes indicate that the program was well implemented, and further lend support to the program rationale.

In terms of ultimate results, that is, changes in actual sexual behaviour, the current program was less successful. Although initial levels of sexual risk were low, and some clinically significant risk reduction behaviours were reported, the students did not, for example, report 100% condom use during vaginal intercourse following the course. This indicates that behaviour change is complex and multifactorial, and that even the changes in knowledge and attitudes that were effected were not sufficient to trigger changes in behaviour.

What are some possible explanations for the lack of change in sexual behaviour? The failure of young heterosexuals to change their sexual behaviour in response to the AIDS pandemic has been attributed to them not personalizing the threat of HIV infection (e.g., Rosenthal & Shepherd, 1993). The present study seems to have been successful in achieving this personalization. Postintervention, the students reported that they had an appreciation of the reality of heterosexual HIV transmission risk, no longer saw AIDS as a disease of the other, and thought that they needed to change their own sexual behaviour. However, the low initial frequency of unsafe sexual practices (i.e., unprotected vaginal intercourse or multiple partners) found in the current sample of undergraduate students appears to have contributed to the lack of measurable change toward safer sexual behaviour.

Knowledge and attitudes did change, and so the task of subsequent research is to determine what other mediating factors influence actual sexual behaviour change.¹⁵ As outlined in Chapter 1, several models of health behaviour change attempt to do just this. For example, the Theory of Reasoned Action (Chan & Fishbein, 1993) would suggest that participants in the current intervention should show behaviour change, given that their attitudes toward the behaviour (condom use) became positive, and that they reported intentions to change. The previously discussed "slant" of the course, that is, the biases toward tolerant attitudes, condom use, and safer sexual behaviour, would also be explained by this model as creating supportive social norms for sexual behaviour change. However, this study underscores the previous criticism of this model, namely that it assumes that behaviour is under cognitive control. This study indicates that knowledge, positive attitudes and intentions to change are not sufficient for actual behaviour change.

As for the tenants of the Health Belief Model (Rosenstock et al., 1994), this study successfully influenced participants' perceived susceptibility to illness (by emphasizing the reality of heterosexual transmission risk) and their perception of the severity of the consequences (by bringing in the AIDS panel). However, the course did not thoroughly address the perceived barriers or costs

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A discussion of the social psychology literature on attitude and behaviour change is outside the scope of this study. However, future research should carefully consider this experimental literature and evaluate the implications for real world health behaviour change.

to changing behaviour; rather, there was an implicit assumption that students, when adequately informed, would want to use condoms. Future versions of this course should explicitly address perceived barriers and costs, and attempt to reduce them.

According to Social Learning Theory (Bandura, 1994) the present intervention can be seen as successfully providing the necessary information, skills, and social support for behaviour change. However, there is one area that was not explicitly provided. Skills for sexual behaviour change, or the consistent performance of safer sex, may not have been sufficiently modelled or rehearsed. It is unclear whether the current intervention provided students with a sense of self-efficacy about behaviours such as sexual communication, negotiation of sexual contact, and condom purchase and use. In the future, as well as instructions, demonstrations and rehearsal of condom use, this course should include the modelling and rehearsal of skills such as how to discuss condom use with a partner, how to resist sexual coercion, how to minimize the likelihood of having unprotected sex in the "heat of the moment" or when under the influence of alcohol or drugs, and other relevant behaviours. Course participants should be encouraged to identify the aspects of adopting safer sexual behaviours that they find difficult, and these should be targetted in the intervention.

In terms of other factors that have been found to influence sexual behaviour change, the present study successfully increased positive attitudes

toward condom use as indicated by students on self-report. However, developmental factors such as sexual inexperience, poor sexual communication, or incomplete sexual identity were not specifically addressed. In summary, this AIDS education course did change knowledge and attitudes, and led to some clinically significant increases in condom use and intentions toward safer sexual behaviour. However, it was less successful at providing modelling and rehearsal of skills for behaviour change, and this may have influenced the minimal impact on sexual behaviour.

B. Methodological Comments

The methodology used for the present research has several areas of strength, and in many ways the current design is an improvement on previous research. The quasi-experimental, preintervention-postintervention design employed in this study took advantage of naturally occurring groups of experimental and control subjects. It was the strongest methodology that could be used without the benefit of random assignment. The design controlled for various threats to internal validity, such as the effects of maturation and history, as well as for any impact of completing the preintervention questionnaires (Newman et al., 1993). The importance of evaluating whether control groups are equivalent to experimental groups has been stressed by other researchers (e.g., Jemmott et al., 1992), and the present study found that the groups were equivalent in preintervention AIDS knowledge, attitudes and sexual behaviour. The methodology also explicitly tested for the impact of the random and fixed

effects of participants within sections before combining sections into intervention versus control groups. The present study had adequate sample sizes, including the proportion of coitally experienced and inexperienced participants, to provide sufficient power for statistical analyses. It also employed an eight-month follow-up on a subsample of participants, which addressed the question of whether changes were maintained over time.

The study design also has implications for the external validity or generalizability of the results. The participants were not randomly selected, but they did appear to be a representative sample of heterosexual undergraduate Canadian university students. The AIDS education course was an elective one with no academic prerequisites, and students from a wide variety of degree programs enrolled in the course. The distribution of age seemed representative of first-year undergraduate students. However, there was a higher proportion of females, and it is unclear whether this represents typical undergraduate classes. These points should be taken into account when generalizing from the results to other heterosexual youth.

As for the generalizability of the AIDS education course itself, the two consecutive classes of Psychology 106 were taught by the same professor, three of the four teaching assistants remained the same, and the course content, tutorial exercises and readings were unchanged. This homogeneity reduced the variability between classes (i.e., the two intervention groups). However, it is not possible to say, based on the data collected here, whether

the course would have the same impact if it were taught by different people. Students did seem to respond to the personalities and presentation styles of the teaching personnel, and it is certainly possible that the impact on, for example, attitudes toward homosexuality, would be different if the content were presented by different teachers (see the previous discussion of this point). In the present study, no differences were found on subjective measures of attitude or sexual behaviour change between students with different teaching assistants. However, all students had the same professor, and so professor effects could not be tested. It would be interesting to examine this in a future study.

Despite the strengths of the methodology chosen for this research, there are several limitations which need to be considered when interpreting the findings. The first set of limitations has been mentioned in previous discussions of the results. Namely, the questionnaires used to measure changes in AIDS knowledge, attitudes and sexual behaviour have limitations that have implications for the reliability, validity and generalizability of the findings (Hingson & Strunin, 1993; McLaws, Oldenburg, Ross & Cooper, 1990). The present study did not seek to develop new instruments to measure AIDS knowledge, attitudes or sexual risk behaviour, but to utilize existing measures with established psychometric properties, and to contribute to the development and refinement of these instruments.

The AIDS Risk Knowledge test scores at preintervention showed little variance and a ceiling effect. The true/false format seems to provide a good

measure of basic AIDS knowledge, but lacks the range of sensitivity that would be most helpful in detecting change. As this measure is refined, the authors have attempted to improve its sensitivity and make content changes that reflect current knowledge about HIV transmission. Continual evaluation and updating of this measure is important. In addition, future research using undergraduate students should use the actual grades, examination results and assignment scores as additional, objective measures of the various domains of knowledge that are shown by research and clinical findings to be linked to attitude and behaviour change.

The AIDS Attitude Scale did seem to provide adequate variability in preintervention scores. Yet the AAS is not a widely researched questionnaire, and it needs further psychometric evaluation to determine more precisely what it is measuring, and how this relates to sexual behaviour change, if at all. The inclusion of the subjective questions about attitude change in this study did provide some useful information which related to these issues. However, the impact of social desirability, given the clear promotion of tolerant attitudes by the professor and the teaching assistants, on the postintervention scores of the experimental subjects was not evaluated. As mentioned previously, this needs to be considered when interpreting the meaning of the measured changes in attitude.

The difficulties in measuring self-reported sexual behaviour have been discussed by many researchers (e.g. Jemmott & Jemmott, 1994). Since sexual

behaviour cannot be assessed directly, self-reports may be intentionally or unintentionally inaccurate. In the current study anonymity was maintained in order to minimize intentional inaccuracies, and students were instructed to answer honestly and explicitly. Still, we cannot be sure that they did so.

The retrospective Sexual Risk Behaviour Survey used in the present study seems to obtain information about sexual practices that can be scored to yield relevant information about sexual activities that carry some risk for HIV transmission. It also used the three-month interval recommended in the literature. However, the following limitations of the questionnaire should be noted. For one, the wording of some of the questions was imprecise; for example, virgin was not operationally defined. This means that it is not clear that the subjects were interpreting the meaning of the word in a consistent manner. In the future, it will be important to give a definition of various terms.¹⁷

There is a second methodological limitation of the sexual risk behaviour data that is more difficult to solve. The task of combining various aspects of sexual behaviour (e.g., the number of partners, frequency of intercourse, and amount of condom use) into one composite variable that provides a valid and meaningful index of sexual risk is one that has only recently been addressed in the literature. While earlier researchers tended to look at each aspect of sexual risk activity separately, it is important to combine the variables in a way that

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For example, "virgin is defined for the purposes of this questionnaire as a person who has not experienced vaginal intercourse."

measures the relative risk of HIV infection. One's "actual" level of sexual risk will in fact be influenced by a combination of these factors, as well as others such as the risk history of the sexual partner, that have not been adequately addressed in evaluation research.

In several recent studies (e.g. Catania et al., 1994; Ford & Norris, 1993; Hansen et al., 1990; Rosenthal & Shepherd, 1993) researchers have created composite measures of sexual behaviour risk. The current study used a combination of their approaches to arrive at the relative risk index. However, the composite risk variable created for the present research did not provide sufficient variability in preintervention sexual risk to allow a sensitive test of behaviour change. In my opinion, this is the area of HIV/AIDS intervention evaluation research that needs the most focus, and has to date been most neglected. If we are attempting to change sexual risk behaviour, we need to be able to measure it in reliable, valid, and meaningful ways. Sexual risk behaviour is complex, and our variables to measure it must be developed so that they reflect this complexity and account for the relative contributions of subject and partner variables to the riskiness of each sexual act.

Finally, it is important to thoroughly understand the meaning of any changes in sexual behaviour that our research does find. For example, if a composite measure of sexual risk is used, a change toward lower risk may be due to participants' reducing their number of sexual partners, using condoms for a greater proportion of intercourse occasions, or simply engaging in less

frequent sexual activity overall. Each of these changes has different implications. Implementing consistent and appropriate condom use during every episode of vaginal intercourse is a more desired outcome of AIDS education than is merely reducing the frequency of intercourse occasions, protected or unprotected. Caution must be exercised when evaluating what "reduction of sexual risk behaviour" actually means.

A second set of methodological considerations is related to several inherent limitations of the study design. These include the following: first, random assignment of subjects was not possible, and so existing groups were used. Potential confounds were addressed by the choice of analyses of covariance. Second, information on potentially important demographic variables (e.g., ethnic identity or religious beliefs) was not collected. It would have been interesting to examine the relationship between these demographic factors and initial attitudes and sexual behaviour, and to changes postintervention. Next, while both experimental and control groups completed the questionnaires during the first and then the last week of classes, experimental group subjects completed the postintervention measures in their small group tutorial, and control group subjects did so in the large lecture setting. There may have been some impact on participants' responses, depending on whether they completed the questionnaires in a large or small group. Another consideration is that the impact of attrition due to participant absence from either the initial or postintervention testing session, or from loss of codenames for matching

purposes (37% of sample) was not evaluated. It appeared that student's absences were not systematic, and that participants who failed to remember their codename were evenly distributed across classes. However, in the future it would be useful to confirm this impression objectively. Finally, it was not possible to collect follow-up data for the entire sample, and so the follow-up findings lack representativeness and statistical power. Given this limitation, these follow-up data are a useful indication that the changes observed at postintervention were maintained over the subsequent eight months, but they cannot be considered to conclusively make that point. In the future it would be useful to have both experimental and control group subjects complete comprehensive follow-up measures in order to further address the question of maintenance of changes.

A third limitation of this study is that it did not include a formal evaluation of what aspects of the intervention were effective for change. A treatment dismantling strategy that would evaluate the relative impact of knowledge increase, attitude change, the AIDS panel, the condom tutorials, the small group discussions, the changing of perceived invulnerability, and other factors would be one way to determine what aspects of the course were influential for change. Without treatment dismantling, the impact of nonspecific factors cannot be ruled out.

Despite the lack of a formal treatment dismantling strategy, some ideas about what aspects of the course were experienced by the participants as most

impactful for change was provided by the content of the subjective reports. Students indicated that the information that convinced them of their own vulnerability to heterosexual HIV transmission, increases in their general AIDS knowledge, and meeting the AIDS panel were most influential in causing them to evaluate and change their attitudes and sexual behaviour. So even without a treatment dismantling evaluation, this study yielded some information about what interventions seemed most influential.

It is also important to acknowledge that a thorough program of treatment dismantling research would be logistically difficult, expensive, and probably ultimately unsuccessful at identifying some discrete agent of change. I believe that it is likely that the impact of an AIDS education course comprises many interrelated factors, and that dismantling it would interfere with its impact. It is probable that different aspects of the course are salient to different participants, and that each student is affected in different ways. This is not to say, however, that it is unimportant to explore what factors, and in what combination, are most important for behaviour change.

A fourth limitation of this research is the following: while the course included some direct education about and demonstrations of condom use, condoms were provided to students, and safer sexual behaviours were discussed, it did not include the formal skills training (e.g., role-playing sexual communication skills) that other researchers have identified to be an important component of behaviour change. This course included more indirect behaviour

change components, for example, discussions of power differences in sexual relationships. In the future, specific target behaviours and related skills should be identified, and explicit skills training should be provided.

In summary, the present study employed a strong quasi-experimental methodology that took advantage of naturally occurring experimental and control groups and had good internal and external validity. The weaknesses of this study were mainly related to the dependent measures and the design of the AIDS intervention course.

C. The Course Itself

The AIDS education course "Psychosocial Parameters of AIDS and HIV," taught as Psychology 106, was very popular with students. As a teaching assistant for this course, I was struck by the enthusiasm and interest of the participants. Many of them commented that within the course they had been exposed, for the first time, to frank and explicit information about human sexuality, prejudice and discrimination, the physical, psychological and social impact of HIV infection, and other topics. They said that the course had a profound impact upon them. Many reported sharing the information with family and friends, encouraging dormitory roommates to carry and use condoms, and challenging their peers' and families' homophobia. As discussed in the Results section and illustrated by sample comments, students reported on subjective measures that the instructor, teaching assistants, AIDS panel and lecture, reading and tutorial material were excellent. Many made a point of praising the

instructor for her open, heartfelt presentation of the material.

The course was intended to provide students with the information to evaluate their own HIV risk behaviour, and the ability to choose and implement safer behaviours should they determine the need to do so. Both objective measures and subjective reports showed that the knowledge increase and attitude change the course promoted did in fact occur. In this respect, the course seems to have been well designed, implemented and taught.

The AIDS intervention did have some shortcomings, however. It was not designed from a particular theory of health behaviour change, and therefore some potentially important aspects of AIDS education were not explicitly incorporated. The AIDS panel discussion made a big impact on the students, but many pointed out that the panel members promoted stereotypes about HIV positive persons, since most of them were intravenous drug users or gay men or both. Future panels should include young men and women who contracted HIV through heterosexual intercourse in order to further emphasize the reality of heterosexual risk. As is discussed previously, more extensive teaching of safer sexual behaviours (including things like sexual communication, negotiation of safer sex, and resisting unsafe sexual encounters by becoming aware of the disinhibiting effects of alcohol and drugs) should be a focus of future versions of the course.

Speaking of the future, is it possible to develop portable versions of this course? I certainly think so. The one aspect that would be impossible to

replicate, as discussed earlier, is the teaching staff. The content, readings, exercises, and AIDS panel could be presented in other universities, schools, and community settings. Obviously the level of difficulty of the university-level material may need to be modified, depending on the target audience. To begin with, I would suggest developing a training manual for a university level course. This could be implemented in universities and colleges across Canada. As one participant noted, in a sentiment that was expressed by many, "everyone should be required to take a course like this. It changed my life."

D. Implications for Future Research

Many of the implications for future research have been covered in previous sections. In this section I will briefly review them, and mention some additional areas that deserve further exploration.

First, in terms of designing interventions, the current course was successful at increasing knowledge and creating more tolerant attitudes, but less successful at changing sexual behaviour. Research suggests the need for cognitive-behavioural interventions that promote social and self-regulatory skills for behaviour change, and concurrently the need for developing community interventions to promote the adoption of safer behaviour as community norms. It seems that modelling and rehearsing safer sex skills is a crucial aspect of successful interventions. It is important to utilize theories of health behaviour change to target specific skills and develop tutorial exercises that focus on this type of training.

A key component of this AIDS education course, and one which was instrumental in attitude change and the personalization of HIV transmission risk, was the five member AIDS panel. The impact of meeting and talking with HIV positive persons was cited by many students as a major factor in their attitude reevaluation and their intentions to use condoms in the future. As mentioned earlier, future courses should endeavour to include panel members who are more similar in age and lifestyle to the students, with the goal of increasing the identification and personalization of the risk associated with heterosexual contact, and the devastating effects of HIV illness.

Future research should attempt to elucidate which aspects of interventions are most important for creating behaviour change. Treatment dismantling strategies, and examination of variables that are found or hypothesized to influence sexual behaviour change, need to examine variables separately and in conjunction in an effort to define intervention features that are tangible, portable and effective. In short, we need to find the factors that actually influence behaviour, and incorporate them into wide-ranging, cost effective, easily presented AIDS intervention that creates behaviour change. Without this, our efforts, despite 15 years of research and evaluation, are in fact resulting in participants with good AIDS knowledge, tolerant attitudes, but continuing risky behaviour. In the field of HIV prevention, two out of three is not enough.

Second, in terms of evaluating interventions, future research should

employ random assignment of students to intervention or control groups, if possible. In the present study, the course was advertised as one on social issues. This is a first year course with no prerequisites that has different content, depending on the instructor. Because the specific content was not determined when the university calendar was printed, many students who enrolled in the course did not know until the first lecture that this section of the course dealt with AIDS and HIV. Most of my students reported that they took the course simply because it fit into their schedule, or they needed an elective, and that they were not aware of the course content. In this manner, self-selection of subjects was likely small for the first few times the course was taught, and I propose that it did not play a significant role in the current study. However, since the course has now been taught repeatedly, there is some "word of mouth" about it, which may mean some people are drawn to the course, and others avoid it. So future evaluations at Simon Fraser University should attempt to use random assignment of subjects, and address this potential confound in the results.

Other important features of future evaluations include the following. Dependent measures of knowledge, attitudes and behaviour should be updated and refined. Both objective measures and subjective ratings should be employed. Given the importance of the relationship between knowledge and attitude change and actual sexual behaviour change, hypothesized intervening variables (such as self-efficacy, perceived susceptibility, costs and benefits of

condom use) should be measured. Composite sexual risk behaviour variables should be created and evaluated. If possible, self-reported sexual risk behaviour should be correlated with objective markers such as condom purchase, HIV test results, prevalence of other sexually transmitted diseases, or the use of other methods of birth control. Thorough follow-up studies are crucial for evaluating the long term impact of interventions. Different factors may be responsible for initial risk reduction and long term maintenance of behaviour change, and this has not been adequately addressed. Finally, it is important to identify and examine the subset of intervention participants who have higher levels of sexual risk behaviour, and attempt to identify demographic, psychological, and social correlates of risky sexual encounters (DiClemente, 1993; Nangle and Hansen, 1993) as a step toward modifying the behaviour.

Third, ultimately the findings of research programs must be translated into widespread policy, social, community and educational changes. Friedman, DesJarlais and Ward (1994) make the point that individualistic models of change have serious limitations, and that social theories of change are needed. They argue for the importance of changing group norms, developing community level interventions, and mobilizing resources to remove social barriers to risk reduction. Since sexual behaviour is a socially situated phenomenon, theories of change must take society, as well as the individual, into consideration. With this in mind, theory and research to date are just starting points. We are still far away from the complex approach that is

necessary to change complex behaviour.

E. A Few Words About SEX...

So, how can we change sexual behaviour? Is it even possible? Or are our efforts in vain?

Sexual behaviour is difficult to change. To prevent HIV transmission in young heterosexuals, monogamy with an uninfected partner or abstinence are the only perfectly safe sexual choices. Obviously these are unrealistic goals for many people. The next safest alternative is the consistent and correct use of condoms during vaginal or anal intercourse, and participation in low-risk activities (such as mutual masturbation) where fluids that can carry HIV are not transmitted. But for many young heterosexuals, adopting safer sexual practices would necessitate significant changes in their current sexual behaviour. And this is difficult to do! Sexual drive is "hard wired." Whether conceptualized from a biological, Darwinian, or Freudian perspective, this behaviour is very difficult to change. In addition, sexual behaviour occurs in interpersonal and societal contexts that exert powerful influences on individual choices, and even whether such choices exist.

Speaking of choices, there is the question of whether it is possible to use rational models of choice and decision making to predict essentially irrational behaviour. Sexual behaviour is often highly motivated by opportunity, arousal, and situation, and less so by reason. Decision making under such circumstances can be less than ideal, and can lead to what Redelmeier, Rozin,

and Kahneman (1993) call suboptimal medical decisions. Simply put, we know that human beliefs are often irrational and inherently biased. The impact of these biases on decisions tends to be greater when emotionally-laden material is involved. Sexual behaviour decisions in response to possible HIV infection risk, given the involvement of emotions, are likely to be subject to these suboptimal medical decisions. For example, people tend to categorize something as either dangerous or safe, without considering a continuum of risk. This can be seen in the current study; students categorized their current, monogamous sexual relationship as safe, but categorized future sexual contact with a new partner as risky, and therefore indicated the intention to use condoms with a new partner. The aim of AIDS education intervention is to develop the understanding and application of a continuum of sexual risk behaviours, challenging this safe versus dangerous polarization and thus expanding the process of personal risk evaluation and subsequent behaviour choices. While findings from cognitive science show how difficult it can be to change beliefs, there are also examples of gradual but widespread changes in beliefs and subsequent behaviour (e.g., the use of seatbelts and child car seats; the elimination of smoking on most airlines and buses, and in many restaurants).

Another author argues, based on his research, that "the widespread occurrence of irrational behaviour should be ample warning that rationality constitutes an ideal for, rather than a true picture of, human action"

(Lachenicht, 1993, p.15). His experiment indicates that frequently recurring temptations are difficult for people to resist, even when the risks of succumbing to the temptations are well understood. This implies that it will be difficult for sexually active people to be consistently safe. He concludes that behavioural programs that provide information and condoms will not be as successful as programs that arise from a specific understanding of sexual behaviour in particular social contexts. Only then can we expect deeper levels of change.

So where can we go from here? It is clear that managing sexual choices and sexual behaviour is very complex. Young people need information about and training in the interpersonal skills that can increase their sexual self confidence and allow them to make informed choices about sexual activity, even in the face of emotional and social demands. They must learn to regulate their behaviour despite the intrinsic, powerful motivation to participate in sexual activity without conscious evaluation and decision making.

The importance of attending to human sexuality in HIV prevention efforts is emphasized in a recent paper by Kelly and Kalichman (1995). These authors make the point that since the goal of AIDS education is to change sexual behaviour, previous research in human sexual behaviour is a crucial, although unfortunately often overlooked, source of information. As psychologists, we should be aware that sexual behaviour occurs within a rich network of emotional, physiological, interpersonal, cultural, societal, moral, procreational, and recreational contexts. AIDS education that simply prescribes abstinence, or

consistent condom use, does not take into consideration the vast network of factors that influence each sexual act.

Some factors that HIV prevention researchers and trainers need to consider include the following: what is the relationship context of sexual activity? Are their multiple partners or monogamous partners, affectionate or casual relationships, heterosexual, bisexual or homosexual contacts? HIV transmission risk increases with multiple or serial sexual partners, and the type of relationship will likely influence the individual's willingness to engage in certain sexual activities, their level of perceived safety, and their level of comfort with discussing and instigating safer behaviours. Perception of the partner as a potential disease vector may be influenced by the emotional attachment and closeness of the relationship. Condom use tends to decline over time with a regular partner, and emotional feelings toward a partner have been shown to influence condom use more than objective information about that person's risk history.

These are but a few of the relationship factors that are relevant to sexual behaviour change, yet are often overlooked by AIDS educators. Sexual behaviour research can inform the design of interventions. For example, teaching condom use as a means by which "people can demonstrate their care, concern and love...(and) emphasizing the benefits of safer sex practices in lovemaking (Kelly & Salichman, 1995, p.909)" may be very important in effecting change.

In addition to the relationship or interpersonal meaning of sexual activity, other areas of importance include the social aspects of sex, power and choice in sexual relationships, coercion, and situational factors such as the use of alcohol and drugs prior to sexual contact.

What about the actual sex acts themselves? There seems to be an assumption in the 1990s that people are sexually sophisticated, and know what they are doing. Yet a cursory glance at magazine covers indicates that this is not the case. People are still widely embarrassed and confused by, and unskillful at, sexual communication and actions. Simply talking about sex with a current or potential partner is difficult and surprisingly rare. Ironically, it appears to be easier to "do it" than to "talk about it." Our job as AIDS educators is to help people make and maintain changes in behaviours that likely feel both awkward and demanding. This is particularly true for youth. For young heterosexuals, unprotected vaginal intercourse is the norm. We need to work with youth to promote communication about sex, to broaden the sexual repertoire to include non-penetrative sexual acts such as oral sex without fluid exchange and mutual masturbation, and to make condom use erotic and fun.

The goal is for youth to be able to choose, initiate and decline sexual activity; to make informed decisions about appropriate partners, when to initiate sexual contact, and when to discontinue a sexual relationship; to be able to communicate important sexual information to their partners; to carry through on intentions to use safer sexual practices; and to be prepared, with condoms and

a sense of playfulness, to incorporate safer sexual choices into a healthy and satisfying sexual life.

In conclusion, as people we need to be comfortable with our bodies and understand our sexual functions, needs, likes, dislikes, and how to make ourselves and others feel good, loved and cared for. We need to determine our own moral and religious beliefs about sexuality, and make comfortable choices about sexual activity. We need and deserve to enjoy an optimal level of health and sexual health. And then we need to have the information and skills to participate in the sexual life we choose. In a perfect world, anyway.

In this imperfect world, the good news is that psychosocial interventions can influence even powerfully driven behaviour. We cannot get people to give up sex, but we can work with them to substitute safer, while still erotic, pleasurable, and rewarding sexual behaviours. Like the song lyric says, "safe sex doesn't mean no sex, it just means use your imagination" (Bragg, 1991). AIDS educators also need to attend to the importance of the social and interpersonal benefits and costs of condom use. With youth, it is particularly important to use positive "hooks," emphasizing features that are relevant to this group. For example, stressing that condoms make sex cleaner and less messy, help the male partner delay ejaculation, and prevent other sexually transmitted diseases can increase the likelihood that young heterosexuals will use condoms (N. E. Adler, personal communication, March 25, 1996).

On a practical level, society, educators and families need to encourage

frank conversation about sex and provide thorough, explicit sex education. Ignorance can only be combatted by the provision of honest and detailed information. The use of language that is appropriate to the target population is crucial; we must avoid desexualized generalities like "exchange of body fluids" and instead refer to "getting cum inside the woman's vagina." It is somewhat shocking to read the previous sentence, isn't it? That makes my point that our society inhibits frank discussions of sexuality, and people are dying because of it.

The Canadian Public Health Association emphasizes that health education about HIV and AIDS for school children must include human sexuality content in order to be effective (de Berger, 1995/1996). While the important roles that each of family, school, public health, and community play in teaching about human sexuality are all acknowledged, the point is made that the school setting is shared by almost all Canadian children and youth, and so it has a particular responsibility to educate. The school system can also ensure that appropriate curricula are instituted, that necessary skills are taught, and that research and evaluation of programs are used to regularly update and refine AIDS education.

There obviously are moral arguments both for and against school-wide sex and AIDS education. However, if we want to protect our youth, information and training must be made widely available. The impact of the current AIDS education course on students' knowledge and attitudes, the prevalence of

unprotected intercourse in this sample, and the statements from students aged 18 to 30 that much of the information was new to them, emphasize that.

As for funding; yes, it is expensive to implement school-wide curricula. However, each HIV infection that is prevented saves inestimable human pain and suffering. Monetarily, it is predicted that each case of HIV that progresses to AIDS costs Canadians \$100,000 in direct care costs and between \$300,000 and \$600,000 in lost productivity and other indirect costs (de Berger, 1995/1996). So if money talks, let us get AIDS education into our schools, universities and colleges, and the workplace.

F. Final Comments

The history of AIDS prevention programs with heterosexual youth can be conceptualized by picturing a spectrum which evolved based upon the changing understanding of the underlying reasons for unsafe sex. At first the important dimension was thought to be a lack of knowledge. Therefore, initial interventions focused on providing information about risk factors and ways to decrease risk. Next, it was determined that heterosexual youth did not personalize risk, and so psychosocial interventions focusing on both knowledge and attitude change were implemented. Currently, it seems apparent that actual heterosexual skills must be targeted, modelled, and rehearsed in order to change actual sexual behaviour.

In the beginning, a sense of profound urgency led to quick, uncontrolled implementation of AIDS prevention programs. Now we have settled in for the

long haul, and like psychotherapy outcome research, AIDS prevention research is shifting toward examining process. The process of changing highly personal, driven, complex behaviours is one of the most difficult challenges psychologists and other researchers have ever faced. It can be discouraging to tackle something so large; but the results of the last ten years of program evaluation have shown us that change is possible. We now must focus on the process of change, and attend to the crucial psychosexual, cognitive, interpersonal, and social factors that influence sexual behaviour. We must pay attention not just to the psychology of behaviour change, but to the psychology of intuition, the psychology of emotion, and the psychology of sexuality. Human sexuality cannot be considered separately from the larger human experience.

AIDS educators are realizing that we must be accountable for our results. We must document, evaluate, and demonstrate the effectiveness of our programs, and continually improve them based upon our findings. Rigorous program evaluation has not traditionally been a part of most AIDS education. But compassion, enthusiasm, and the commitment to educate and change behaviour are not enough. Community, school, and street level AIDS educators have realized they too must become, or collaborate with, researchers and through evaluation improve upon the AIDS education that has been developed so far.

The present study was designed to evaluate a course that seemed to be having a big impact on the attitudes and reported sexual behaviour of its

students. Without program evaluation, we would have believed that the course caused students to significantly increase their condom use, as well as gain AIDS knowledge and develop tolerant attitudes. The study did show that students increased their knowledge and changed their attitudes, but that although there were clinically significant changes toward safer sexual behaviour, unprotected vaginal intercourse with a steady partner was still the norm.

This research also contributes to a broader understanding of the current level of AIDS knowledge, attitudes, and sexual behaviour in the Canadian university student population. It builds on existing research by showing the importance of targeting attitudes and promoting the personalizing of risk when designing AIDS education. A unique contribution of the present study is the finding that the panel of persons with HIV or AIDS was a key factor in decreasing homophobia, increasing tolerant attitudes and emphasizing the reality of HIV transmission risk. This research also shows that even large changes in knowledge and attitudes may not effect sexual behaviour. The goal of future programs include designing cognitive-behavioural skills training for sexual behaviour change, and implementing similar programs at Canadian universities, colleges, and schools. As well as the immediate applications to AIDS education, this research has long term implications for theories of decision making and behaviour change.

The take home-message, however, is a discouraging one; namely, that it is hard to change sexual behaviour. This group, young heterosexuals, tend to

have one steady sexual partner and do not perceive themselves to be at risk for HIV. We must intervene earlier in psychosexual development and teach condom use with the first sexual partner, before sexual patterns are established. We need to begin prevention while the prevalence of HIV infection in this population is still low. This accomplishment involves accelerating policy reform; providing access to AIDS education; making condoms readily available in schools, universities, and the community; improving interventions; and sustaining changes through organizational structures. This calls for specific programs at the academic level in Canadian schools and universities; currently, there is no formal country wide policy, and institutions differ in their provision of resources.

On an encouraging note; the students in the present study did exhibit some clinically meaningful changes in their sexual behaviour, namely increased frequency of condom use and the intention to use condoms with future sexual partners. And even small changes toward safer behaviour can save a life. The changes effected by this course are important, even if they are inconsistent and incomplete. We have to keep trying. Psychosocial research and the promotion of behaviour change remain our only line of defence against HIV transmission. While prevention is often trivialized in funding decisions, it is an integral part of a multi-faceted approach to ending AIDS. This is a behaviourally transmitted virus that leads to fatal illnesses, and so we must focus on a behavioural solution, particularly in the absence of a vaccination or cure.

Unfortunately, the ideas and recommendations presented here, and elsewhere, are in conflict with the powerful conservative force that is currently growing in North America. There is political, social, cultural and religious opposition to sex education, civil rights for same-sex couples, condom distribution, and other areas that are crucial, as pointed out repeatedly here, to the successful implementation of AIDS prevention programs. For example, a few weeks before the submission of this dissertation I spotted the following headline on the front page of the San Francisco newspaper; "Dispute over AIDS education: Kopp's bill calls for parental consent" (Asimov, 1996, p. A1). The story described a bill "quietly making its way through the state legislature" that would require parental consent for students to be taught about any sexually transmitted disease. The bill would also abolish from law the line "all AIDS education must be taught with compassion about people with HIV." Need I say more? And to think this news report comes from the city that we would expect to be the most aware of the dangers of HIV infection and the most compassionate toward its victims. What can we expect from Duncan, British Columbia? I fear that if this conservative force prevails, and sex education is taken out of the classroom and back to the family dinner table, we will continue to be a nation of ignorant, embarrassed, and confused sexual beings who lack the skills to participate in healthy, and safe, sexual relationships. And that can kill us, and our children.

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- Yep, G. A. (1993). Health beliefs and HIV prevention: Do they predict monogamy and condom use? Journal of Social Behavior and Personality, 8(3), 507-520.
- Young, R. K., Gallaher, P. E., Marriott, S., & Kelly, J. (1993). Reading about AIDS and cognitive coping style: Their effects on fear of AIDS and homophobia. Journal of Applied Social Psychology, 23, 911-924.
- Zimmerman, R. S., & Olson, K. (1994). AIDS-related risk behavior in a sexually active, heterosexual sample: A test of three models of prevention. AIDS Education and Prevention, 6(3), 189-205.

APPENDIX A

Demographic Sheet

AIDS Risk Knowledge Test

AIDS Attitude Scale

Risk Behaviour Survey

Subjective Questionnaire

CODE NAME: _____

Please answer the following questions honestly. This information is anonymous - do not write your name or student number on this sheet.

Your answers to these questions are for descriptive purposes only.

DATE: _____

Demographic Information:

Sex: Male _____ Female _____

Age: _____

Year in post-secondary education: _____

Program of study: (i.e. Arts, Sciences, Psychology, Commerce, etc.)

AIDS KNOWLEDGE QUESTIONNAIRE

Please mark each statement "true" or "false" by circling the appropriate word. Please do not skip any questions.

- | | | |
|------|-------|--|
| True | False | 1. Most people who transmit the AIDS virus look unhealthy. |
| True | False | 2. Anal intercourse is high risk for transmitting the AIDS virus |
| True | False | 3. Oral intercourse carries risk for AIDS virus transmission. |
| True | False | 4. A person can be exposed to the AIDS virus in one sexual contact. |
| True | False | 5. Keeping in good physical condition is the best way to prevent exposure to the AIDS virus. |
| True | False | 6. It is unwise to touch a person with AIDS. |
| True | False | 7. Condoms make intercourse completely safe. |
| True | False | 8. Showering after sex greatly reduces the transmission of AIDS. |
| True | False | 9. When people become sexually exclusive with one another, they no longer need to follow "safe sex" guidelines. |
| True | False | 10. Oral sex is safe if the partners "don't swallow". |
| True | False | 11. Most people who have been exposed to the AIDS virus quickly show symptoms of serious illness. |
| True | False | 12. By reducing the number of different sexual partners, you are effectively protected from AIDS. |
| True | False | 13. The AIDS virus does not penetrate unbroken skin. |
| True | False | 14. Female-to-male transmission of the AIDS virus has not been documented. |
| True | False | 15. Sharing toothbrushes and razors can transmit the AIDS virus. |
| True | False | 16. Pre-ejaculatory fluids carry the AIDS virus. |
| True | False | 17. Intravenous drug users are at risk for AIDS when they share needles. |
| True | False | 18. A person must have many different sexual partners to be at risk from AIDS |
| True | False | 19. People carrying the AIDS virus generally feel quite ill. |
| True | False | 20. Vaginal intercourse carries high risk for AIDS virus transmission. |
| True | False | 21. Withdrawal immediately before orgasm makes intercourse safe. |
| True | False | 22. Persons who are exclusively heterosexual are not at risk from AIDS. |
| True | False | 23. Healthy persons in AIDS risk groups should not donate blood. |
| True | False | 24. Sharing kitchen utensils or a bathroom with a person with AIDS poses no risk. |
| True | False | 25. Intravenous drug user become exposed to the AIDS virus because the virus is often contained in heroin, amphetamines, and the injected drugs. |

- | | | |
|------|-------|---|
| True | False | 26. A wholesome diet and plenty of sleep will keep a person from becoming exposed to the AIDS virus. |
| True | False | 27. A cure for AIDS is expected within the next two years. |
| True | False | 28. It is more important to take precautions against AIDS in large cities than in small cities. |
| True | False | 29. A negative result on the AIDS virus antibody test can occur even for people who carry the virus. |
| True | False | 30. A positive result on the AIDS virus antibody test can occur even for people who do not carry the virus |
| True | False | 31. Coughing does not spread AIDS. |
| True | False | 32. Only receptive (passive) anal intercourse transmits AIDS. |
| True | False | 33. Most present cases of AIDS are due to blood transfusions that took place before 1984. |
| True | False | 34. Most persons exposed to the AIDS virus know they are exposed. |
| True | False | 35. A great deal is now known about how the AIDS virus is transmitted. |
| True | False | 36. Donating blood carries no AIDS risk for the donor. |
| True | False | 37. No cases of AIDS have ever been linked to social (dry) kissing. |
| True | False | 38. Mutual masturbation and body rubbing are low in risk unless the partners have cuts or scratches. |
| True | False | 39. People who become exposed to the AIDS virus through needle-sharing can transmit the virus to others during sexual activities. |
| True | False | 40. The AIDS virus can be transmitted by mosquitoes or cockroaches. |

Instructions: For each of the following statements, please note whether you agree or disagree with the statement. Please respond to all items on the questionnaire. There are NO right or wrong answers. Use the following scale:

- SA: Strongly agree with the statement
- A: Agree with the statement
- N: Neither agree nor disagree with the statement
- D: Disagree with the statement
- SD: Strongly disagree with the statement

1. Limiting the spread of AIDS is more important than trying to protect the rights of people with AIDS.

SA A N D SD

2. Support groups for people with AIDS would be very helpful to them.

SA A N D SD

3. I would consider marrying someone with AIDS.

SA A N D SD

4. I would quit my job before I would work with someone who has AIDS.

SA A N D SD

5. People should not be afraid of catching AIDS from casual contact, like hugging or shaking hands.

SA A N D SD

6. I would like to feel at ease around people with AIDS.

SA A N D SD

7. People who receive positive results from the AIDS blood test should not be allowed to get married.

SA A N D SD

8. I would prefer not to be around homosexuals for fear of catching AIDS.

SA A N D SD

9. Being around someone with AIDS would not put my health in danger.

SA A N D SD

10. Only disgusting people get AIDS.

SA A N D SD

11. I think that people with AIDS get what they deserve.

SA A N D SD

12. People with AIDS should not avoid being around other people.

SA A N D SD

13. People should avoid going to the dentist because they might catch AIDS from dental instruments.

SA A N D SD

14. The thought of being around someone with AIDS does not bother me.

SA A N D SD

15. People with AIDS should not be prohibited from working in public places.

SA A N D SD

16. I would not want to be in the same room with someone who I knew had AIDS.

SA A N D SD

17. The "gay plague" is an appropriate way to describe AIDS.

SA A N D SD

18. People who give AIDS to others should face criminal charges.

SA A N D SD

19. People should not be afraid to donate blood because of AIDS

SA A N D SD

20. A list of people who have AIDS should be available to anyone.

SA A N D SD

21. I would date a person with AIDS.

SA A N D SD

22. People should not blame the homosexual community for the spread of AIDS in the United States.

SA A N D SD

23. No one deserves to have a disease like AIDS.

SA A N D SD

24. It would not bother me to attend class with someone with AIDS.

SA A N D SD

25. An employer should have the right to fire an employee with AIDS regardless of the type of work s/he does.

SA A N D SD

27. People get AIDS by performing unnatural sex acts.

SA A N D SD

28. People with AIDS should not be looked down upon by others.

SA A N D SD

29. I could tell by looking at someone if s/he had AIDS.

SA A N D SD

30. It is embarrassing to have so many people with AIDS in our society.

SA A N D SD

31. Health care workers should not refuse to care for people with AIDS regardless of their personal feelings about AIDS.

SA A N D SD

32. Children who have AIDS should not be prohibited from going to schools or day care centers.

SA A N D SD

33. Children who have AIDS probably have a homosexual parent.

SA A N D SD

34. AIDS blood test results should be confidential to avoid discrimination against people with positive results.

SA A N D SD

35. AIDS is a punishment for immoral behavior.

SA A N D SD

36. I would not be afraid to take care of a family member with AIDS.

SA A N D SD

37. If I discovered that my roommate had AIDS, I would move out.

SA A N D SD

38. I would contribute money to an AIDS research project if I were making a charitable contribution.

SA A N D SD

39. The best way to get rid of AIDS is to get rid of homosexuality.

SA A N D SD

40. Churches should take a strong stand against drug abuse and homosexuality to prevent the spread of AIDS.

SA A N D SD

41. Insurance companies should not be allowed to cancel insurance policies for AIDS-related reasons.

SA A N D SD

42. Money being spent on AIDS research should be spent instead on diseases that affect innocent people.

SA A N D SD

43. A person who gives AIDS to someone else should be legally liable for any medical expenses.

SA A N D SD

44. The spread of AIDS in the United States is proof that homosexual behavior should be illegal.

SA A N D SD

45. A list of people who have AIDS should be kept by the government.

SA A N D SD

46. I could comfortably discuss AIDS with others.

SA A N D SD

47. People with AIDS are not worth getting to know.

SA A N D SD

48. I have no sympathy for homosexuals who get AIDS.

SA A N D SD

49. Parents who transmit AIDS to their children should be prosecuted as child abusers.

SA A N D SD

50. People with AIDS should be sent to sanitariums to protect others from AIDS.

SA A N D SD

51. People would not be so afraid of AIDS if they knew more about the disease.

SA A N D SD

52. Hospitals and nursing homes should not refuse to admit patients with AIDS.

SA A N D SD

53. I would not avoid a friend if s/he had AIDS.

SA A N D SD

54. The spread of AIDS in our society illustrates how immoral the United States has become.

SA A N D SD

SEXUAL BEHAVIOUR SURVEY

Please answer the following questions.

1. Sexual preference: Do you consider yourself to be

Heterosexual (straight) _____
Homosexual (gay/lesbian) _____
Bisexual _____

2. Are you a virgin? Yes _____ No _____

3. If no, at what age did you lose your virginity? (that is, experience sexual intercourse)

Age _____

4. How many sexual partners have you had in total? _____

5. How many sexual partners have you had in the last year? _____

6. How many sexual partners have you had in the last three months? _____

7. What is your relationship with your most recent sexual partner?

Spouse _____

Fiance(e) _____

Steady partner _____

Casual partner _____

Other _____

8. Please give an estimate of the number of times you have engaged in the following sexual behaviour in the last three months:

Oral sex _____

Vaginal intercourse _____

Anal intercourse _____

9. Have you ever used a condom?
Yes _____
No _____
10. Did you use a condom in your most recent sexual intercourse?
Yes _____
No _____
11. Do you intend to use a condom in your next sexual intercourse?
Yes _____
No _____
12. Do you intend to use a condom in your next sexual intercourse with a new partner?
Yes _____
No _____
13. What percentage of time, in the last three months, have you used a condom during:
Oral sex _____%
Vaginal intercourse _____%
Anal intercourse _____%
14. Have you ever had an HIV (AIDS) test?
Yes _____
No _____

Have you changed your own risk behaviour (i.e., sexual behaviour) as a result of taking Psychology 106?

YES _____

NO _____

Please Explain:

What aspects of the course, if any, caused you to change, or consider changing, your risk behaviour?

Do you have any suggestions on how to make Psychology 106 more effective in causing students to change their risk behaviour?

Have your attitudes towards homosexuality changed as a result of taking Psychology 106?

YES _____

NO _____

Please Explain:

THANK YOU FOR YOUR HELP!!

Please mark which T.A. you had:

Amy _____

Cindy _____

Pat _____

Cheryl _____

Angela _____

APPENDIX B

Course Outline

Reading List

PSYCHOLOGY 106

PSYCHOSOCIAL PARAMETERS OF AIDS AND HIV INFECTION

Course Outline

Week	Topic
1	Overview <ul style="list-style-type: none">- AIDS as a biopsychosocial phenomenon- global and local epidemiology- the myth of risk groups and the reality of risk behaviours
2,3	The continuum of HIV infection <ul style="list-style-type: none">- basic virology- symptomology- HIV transmission and prevention- the HIV = AIDS debate
4	The HIV antibody test <ul style="list-style-type: none">- social and psychological impact- ethical concerns
5	AIDS and the gay community <ul style="list-style-type: none">- what is the gay community- heterosexism & homophobia
6	midterm exam
7	AIDS and injection drug use <ul style="list-style-type: none">- special issues related to i.v. drug use- prevention strategies for active users
8	Women and AIDS <ul style="list-style-type: none">- the missing persons in the AIDS epidemic- diagnostic, clinical, and social disparities
9	Panel discussion & small group meetings with persons with HIV/AIDS
10,11	Psychological parameters of the HIV/AIDS epidemic <ul style="list-style-type: none">- clinical issues- countertransference- death & dying- grief & bereavement
12	Ethical considerations

PSYCHOLOGY 106

PSYCHOSOCIAL PARAMETERS OF AIDS AND HIV INFECTION

READING ASSIGNMENTS

section 1 Overview: AIDS as a biopsychosocial phenomenon

Wallman, S. (1988). Sex and death: The AIDS crisis in social and cultural context. Journal of Acquired Immune Deficiency Syndromes, 1(6), 571-577.

Epidemiology. In AIDS antibody testing. B.C. Ministry of Health, Prevention Services Program, Division of STD Control, p. III.5.

Mann, M., Chin, J., & Quinn, T. (1988). The international epidemiology of AIDS. Scientific American, 259(4), 82-89.

Piot, P., Laga, M., & Ryder, R. et al (1990). The global epidemiology of HIV infection: Continuity, heterogeneity, and change. Journal of Acquired Immune Deficiency Syndromes, 3(4), 403-412.

section 2 The continuum of HIV infection

Transmission. In AIDS antibody testing. B.C. Ministry of Health, Prevention Services Program, Division of STD Control, p. III.3.

Safe sex guidelines. In AIDS antibody testing. B.C. Ministry of Health, Prevention Services Program, Division of STD Control, p. V.20-V.22

Adler, M.W. (1987). Range and natural history of infection. In The ABC of AIDS (pp. 11-13).

*** The following charts, diagrams, and summaries have been included in your reading package to provide you with graphic illustration and quick reference to the material which is being covered in weeks 2 and 3.

Central role of T4 lymphocytes

Replication

Clinical presentation of early HIV infection

Clinical course of HIV infection

Management of HIV infection

Clinical presentation of AIDS

Common symptoms of HIV disease.

For your information: It may not be what it seems.

section 3 Hiv infection, cont.

Cotton, P. (1990). Cofactor question divides codiscoverers of HIV. Journal of the American Medical Association, 264(24), 3111-3112.

Sunday Times articles

Invincible AIDS, Time Magazine, August, 1992

AIDS: Words from the front, Spin Magazine, January, 1988.

Kangaroo court etiology, New York Native, May, 1988.

section 4 The HIV antibody test

HIV antibody testing. In AIDS antibody testing. B.C. Ministry of Health, Prevention Services Program, Division of STD Control, pp. IV.1-IV.3.

Dlugosch, G., Gold, M., & Dilley, J. (1986). AIDS antibody testing: Evaluation and counseling. Focus: A Review of AIDS Research, 1(8), 1-3.

Goldblum, P. & Seymour, N. (1987). Whether to take the test: Counseling guidelines. Focus: A Guide to AIDS Research, 2(5), 1-2.

Bayer, R. (1989). Ethical and social policy issues raised by HIV screening: The epidemic evolves and so do the challenges. AIDS, 3(3), 119-124.

section 5 Social parameters of the HIV/AIDS epidemic

Herek, G.M. & Glunt, E.K. (1988). An epidemic of stigma. American Psychologist, 43(11), 886-891.

Brandt, A.M. (1988). AIDS in historical perspective: Four lessons from the history of sexually transmitted diseases. American Journal of Public Health, 78(4), 367-371.

Dalton, H.L. (1991). AIDS in blackface. In N.F. McKenzie (Ed.) The AIDS reader: Social, political, ethical issues (pp. 122-143). New York: Meridian.

Smith, G.S. (1989). Historical perspectives on AIDS, society, culture, and STDs. Queen's Quarterly, 96(2), 244-262.

section 6 AIDS and the Gay Community

Bridger, S. (1991, September). Homo hate. Angles, p.3.

Niesen, J.H. (1990). Heterosexism: Redefining homophobia for the

1990s. Journal of Gay & Lesbian Psychotherapy, 1(3), 21-34.

Homophobia, heterosexism, & AIDS. (1991) Canadian AIDS Society, 10-40.

Frutchey, C. (1988). Homophobia in AIDS education: Counterproductive to prevention. Focus: A Guide to AIDS Research, 3(2), 3-4.

Dupree, J.D. & Margo, G. (1988). Homophobia, AIDS, and the health care professional. Focus: A Guide to AIDS Research, 3(2), 1-2.

section 7 AIDS and Injection Drug Use

Des Jarlais, D.C. & Friedman, S.R. (1988). The Psychology of preventing AIDS among intravenous drug users: A social learning conceptualization. American Psychologist, 43(11), 865-870.

Des Jarlais, D.C. & Friedman, S.R. (1988). HIV infection among persons who inject illicit drugs: Problems and prospects. Journal of Acquired Immune Deficiency Syndromes, 1(3), 267-273.

Springer, E. Harm reduction model for working with drug users during the AIDS epidemic. pp. 270-271.

Friedman, S.R. & Des Jarlais, D.C. (1991). HIV among drug injectors: The epidemic and the response. AIDS Care, 3(3), 239-250.

Friedman, S.R. & Casriel, C. (1988). Drug users' organizations & AIDS policy. AIDS & Public Policy Journal, 3(2), 30-36.

section 8 Women and AIDS

Schneider, B.E. Gender and AIDS. pp. 97-106

Anastos, K. & Marte, C. (1991). Women - The missing persons in the AIDS epidemic. In N.F. McKenzie (Ed.) The AIDS reader: Social, political, ethical issues (pp. 191-199). New York: Meridian.

Mays, V.M. & Cochran, S.D. (1988). Issues in the perception of AIDS risk and risk reduction activities by Black and Hispanic\Latina women. American Psychologist, 43(11), 949-957.

Day, S. (1988). Prostitute women and AIDS: Anthropology. AIDS, 2, 421-428.

Cohen, J.B. (1989). Overstating the risk of AIDS: Scapegoating prostitutes. Focus: A Guide to AIDS Research, 4(2), 1-2.

section 9 Psychological parameters of the HIV/AIDS epidemic

Christ, G.H., Moynihan, R.T., Gallo-Silver, L., & Beckham, D. HIV illness: Psychosocial tasks.

Kelly, J.A. & Murphy, D.A. Psychological interventions with AIDS and HIV: Prevention and treatment. Journal of Consulting & Clinical Psychology. in press

Dilley, J.W. & Boccellari, A. (1988). AIDS dementia complex: Diagnosis and management. Focus: A Guide to AIDS Research, 3(8), 1-3.

Miller, D. & Riccio, M. (1990). Non-organic psychiatric and psychosocial syndromes associated with HIV-1 infection and disease. AIDS, 4(5), 381-388.

section 10 Psychological parameters cont.

Woods, W.J. (1988). Whether to take experimental drugs: Counseling issues. Focus: A Guide to AIDS Research, 3(6), 1-2.

Moynihan, R., Christ, G., & Gallo Silver, L. (1988). AIDS and terminal illness. Social Casework, 69(6), 380-387.

Klass, P. (1985). What it feels like to be dying and all that jazz. Discover, December, 18-19.

Dunkel, J. & Hatfield, S. (1986). Countertransference issues in working with persons with AIDS. Social Work, 3(2), 114-117.

Macks, J. (1988). Women and AIDS: Countertransference issues. Social Casework, 69(6), 340-347.

section 11 Ethical considerations

Roy, D. (1990). Humanity, the measure of an ethics for AIDS. Journal of Acquired Deficiency Syndromes. 3, 449-459.

Dixon, R.E. (1988). Sacred secrets: Confidentiality, informed consent, and diagnostic testing in the AIDS era. Infection Control & Hospital Epidemiology, (5), 187-188).