Declaration:

Unless specifically indicated to the contrary, this project is the result of my own work.

Acknowledgements

I would like to acknowledge the assistance of Professor Linda Richter of the School of Psychology, University of Natal, Pietermaritzburg, who was appointed to supervise the work. I would also like to acknowledge the advice on statistical analysis given by Professor Robert Magnani of Tulane University.

Abstract

Using Jessor's psychosocial framework of risk behaviour, this study examined the impact of variables within a number of risk domains on condom use at last sex. The sample was 587 sexually active male and female black youth between the ages of 16 and 20 years old from the township areas of Soweto (Johannesburg), Umlazi (Durban) and Khayelitsha (Cape Town). Binary logistic regression models were used in the analysis.

Within the biological risk domain, gender was a significant predictor of condom use at last sex. None of the proximate social context variables, *viz.* parental education, family structure, and parent-adolescent communication, were significant predictors. Health services' promotion of condom use was a significant predictor within the distal social context.

Within the perceived environment in relation to the self, perception of risk and perception of barriers were significant predictors of condom use at last sex. None of the variables within the perceived environment in relation to peers domain, *viz.* perceived peer attitudes to condoms and peers suffering the negative consequences of unprotected sex, were significant.

The personality domain contained measures of self-esteem, future time orientation, locus of control and fatalism. Locus of control was the only significant predictor within this domain of condom use at last. Engagement in other risk taking behaviour, such as smoking cigarettes, alcohol and drug use, was a significant predictor within the general behaviour domain. Within the sexual behaviour domain, partner discussion and contraceptive use were significant predictors of condom use at last sex.

In the final model, the significant predictors in order of importance, were the perception of risk, the promotion of condom use by a health professional, locus of control, discussion with a partner, the perception of barriers, the use of contraceptives, and risk taking behaviour. The only interaction in the final model of condom use at last sex was between the promotion of condom use by a health professional and concurrent use of other forms of non-barrier contraception.

Contents

1. Introduction

1.1. Scope of the problem

"The HIV/AIDS epidemic has taken on shattering dimensions and now accounts for one-in-four of all deaths [in South Africa] according to the Medical Research Council" (Barrell & Kindra, 2001, p.2).

The MRC report estimated that in the year 2000, approximately 40% of the deaths among people 15 to 49 years of age were due to HIV/AIDS. There has been a marked increase in the number of AIDS related deaths within the 15 to 49 year age group. It was estimated that in 1995, 9% of deaths were AIDS related. This figure rose to 19% in 1997, 33% in 1999 and 40% in the last year (Barrell & Kindra, 2001).

Younger people, in particular, are prime targets for infection. Around half of all adults who acquire HIV become infected before their 25th year and projections indicate that some 50% of these young people will die before their 35th birthday (loveLife, 2001). HIV prevalence rates were estimated to be between 23-27 percent for females aged 15-24 and 8-15 per cent for males of the same age (UNAIDS, 2000). Gender differences are pronounced, with women between the ages of 15 and 20 years at highest risk (loveLife, 2001). The prevalence of HIV infection amongst South African youth is daunting. This, coupled with the fastest growing rates of infection in the world, presents a bleak picture. Exemplary in this regard is that within the space of 4 years (1994-1998) the proportion of HIV positive 15-19 year olds increased from 7% to 21% (Whiteside, 1999).

Research into the AIDS epidemic worldwide has revealed that adolescence constitutes *the* predominant risk phase for HIV infection; estimates indicate that 60% of all new HIV infections occur amongst 15 - 24 year olds (DiClemente, 1990). In addition, in many parts of the world the incidence of other sexually transmitted diseases is highest among young adults and adolescents (Santelli & Kirby, 1992). A related consideration is that of unwanted adolescent pregnancies. These are of worldwide concern and have been identified as one of the most critical health problems in South Africa (Forrest, 1990; Murray, 1986). South Africa exhibits high levels of teenage child bearing with one report estimating that approximately 30% of 20-24 year olds have given birth by the age of 20 (CSS, 1997). Similar reports suggest that even this figure is conservative. For example, the 1998 South African Demographic and Health survey indicated that as many as 35% of 19-year-olds have given birth at least once (MRC & Department of Health, 1999).

The transmission of HIV/AIDS amongst adolescents takes place predominately via heterosexual intercourse (Moore & Rosenthal, 1993). The pursuit of an AIDS vaccine remains a critical international goal, and clinical trials are presently underway. However, an AIDS vaccine that can be feasibly provided to populations at risk is unlikely to become a reality in the near future (loveLife, 2001). Therefore, prevention of transmission has been encouraged in three principal ways: delaying the initiation of sexual intercourse; abstaining from acquiring additional sexual partners if already sexually active (maintaining a monogamous relationship), and consistent and proper condom use with every sexual encounter (Perkel, 1992; Thompson, 1996).

Refraining from sexual intercourse is the only sure way to prevent infection. However, the increasing delay of marriage, along with the falling age of menarche, has resulted in a greater number of years spanning these two events. This has had the result of increasing the number of sexually active, unmarried adolescents (Bongaarts & Cohen, 1998; Blanc & Way, 1998; Gage-Brandon & Meekers, 1993).

Sexual intercourse between partners who are both HIV-negative and who have sex only with one another only, is another way to practice safer sex. However, both a partner's HIV status and fidelity are often unknown.

The correct and consistent use of latex condoms treated with a spermicide (for example, nonoxinol-9) is another way to practice safer sex. Latex condoms are effective at blocking transmission of HIV because the pores in latex condoms are too small to allow the passage of the virus. In addition to this, condoms have been shown to be effective barriers not only to HIV but also to herpes simplex, hepatitis B, chlamydia and gonorrhea (Carey, Herman & Retta, 1992; Feldblum, Morrison & Roddy, 1995).

1.2. Sexual behaviour

A review of the South African literature indicates that the sexual behaviour of adolescents is characterised by:

- early initiation (Buga, Amoko & Ncayiyana, 1996; Flisher, Ziervogel, Charlton, Leger & Robertson, 1993; Nicholas,1994; Preston-Whyte & Zondi, 1991; NPPHCN, 1995)
- mainly penetrative, heterosexual sexual intercourse (Preston-Whyte et al, 1991; NPPHCN, 1995)
- multiple partners (Flisher et al, 1993; Richter, 1996)
- lack of effective contraception (Buga et al,1996; Nicholas,1994; Richter, 1996)
- lack of condom use (Buga et al, 1996; Flisher et al , 1993; Richter, 1996)

Managing or even stopping the spread of HIV currently rests in changing these patterns. A seemingly obvious solution appears to be the education of adolescents about the dangers of and the need for changes to, risky behaviour. However, it has become clear that knowledge and the desire to protect oneself does not necessarily translate into effective behavioural change. This may be because the behaviour requiring modification or change - sexual behaviour - is amongst the most powerfully reinforcing that people can encounter. The risky behaviours responsible for HIV infection occur in the context of an individual's interpersonal relationships. Thus, there are a number of important mediating variables that are derived not only from internal psychological and personological factors but also from the external environmental context (Perkel, 1992; Thompson, 1996).

1.3. The application of existing theory to safer sex behaviour among adolescents

A number of theories and models have been used to explain adolescent risky and safer sex behaviours. A few of these are briefly outlined below.

1.3.1. Health Belief Model

The Health Belief Model (HBM) proposes that measurable attitudes and beliefs can predict preventative health action. These include beliefs that one is susceptible to the disease in question; beliefs that the consequences of the disease are severe; belief in the benefits of taking action; and belief in barriers or disadvantages to the implementation of health action. Beliefs in (or perceptions of) severity and susceptibility are necessary before a commitment to changing risky behaviours can be made. Those committed to taking action can then assess the benefits and the barriers of taking action. If the benefits outweigh the barriers, the individual would be more likely to take preventative action (Moore, Rosenthal & Mitchell, 1996; Perkel, 1992; Rosenstock, Stretcher & Becker, 1994).

Later versions of the HBM by Janz and Becker (1984) include cues to action as well as a motivational factor. Cues to action refer to the external or internal stimuli that are necessary to trigger the health action decision making process. The combined levels of susceptibility and seriousness provide the energy or force to act, and the perception of benefits (minus the barriers) provides a preferred path of action. The motivational factor is defined as the value that the individual places on maintaining a state of health (Moore et al, 1996; Perkel, 1992; Rosenstock et al, 1994).

Petosa and Jackson (1991) found that 43% of the variance in the intentions to adopt safer sex behaviours among seventh grade adolescents could be explained by HBM variables. However, among ninth grade adolescents only gender, cues to action and perceived susceptibility were significant predictors, accounting for 27% of the variance. Among the eleventh grade sample, gender was the only significant predictor of intentions to adopt safer sex behaviours, accounting for 17% of the variance. Petosa and Jackson (ibid.) concluded that forces other than health concerns influenced the sexual intentions of the older adolescents. These forces included the need for peer acceptance and the need to be viewed as mature.

Walter, Vaughan, Gladis, Ragin, Kasen and Cohall (1993) interviewed 531 Black and Hispanic tenth graders in New York. They found that variables such as self-efficacy and peer norms were more strongly and consistently related to intentions regarding condom use, in comparison to the HBM variables. These findings were verified in a later study with 926 Black and Hispanic ninth to twelfth grade New York public school students. This study concluded that HBM variables played a small explanatory role in predicting intentions in comparison to variables such as self-efficacy and behavioural norms (Walter, Vaughan, Ragin, Cohall & Kasen, 1994).

In terms of actual behaviour, Rosenthal, Hall and Moore (1992) concluded that the HBM had doubtful usefulness in explaining condom use with casual and regular partners in a sample of Australian, first-year university students. Lollis, Johnson and Antoni (1997) found that HBM components did not significantly predict condom use during vaginal or oral sex among White, Australian, heterosexual college students.

Research has demonstrated that the model's predictive value in the case of safer sex behaviour is limited (Abraham, Sheeran, Spears & Abrams, 1992; Rosenthal et al, 1992). However, Rosenstock et al (1994) suggest that this may be because many of the studies cited did not use the HBM as a whole, but rather analysed the constructs separately as equally weighted variables. A further problem with this model is that it does not contextulise sexual risk taking behaviour (Moore et al, 1996).

1.3.2. Theory of Reasoned Action

The Theory of Reasoned Action (TRA) maintains that an individual's behaviour is best predicted by their intention to engage in a given action. Intention is influenced by the individual's attitude to the behaviour and their subjective norms. The individual's attitude is determined by specific beliefs about the behaviour and the perceived consequences of engaging in it. Subjective norms regarding behaviour are determined by two factors: firstly, by the individual's beliefs about what specific people, who are important to them, think that they should be doing and secondly, by the individual's motivation to comply with the perceived social norms (Adler & Rosengard, 1996; Moore et al, 1996).

Rise (1992) found that attitudes and subjective norms accounted for 34% of the variance of intentions to use condoms at next sexual intercourse among 1172 Norwegian adolescents. However, when prior behaviour was included in the model, 61% of the variance was accounted for; thus the effects of attitudes and subjective norms were reduced.

White, Terry and Hogg (1994) found in a sample of Australian undergraduate students that attitudes, subjective norms and group norms were distinctive predictors of intentions. However, the addition of self-efficacy and planning variables explained a significant amount of variance in intention, after controlling for attitudes and norms. In terms of actual behaviour, intentions explained a significant proportion of the variance in condom use but did not significantly predict discussion of condom use with new partners. It was concluded that control factors (self-efficacy and planning) were necessary to predict intentions and behaviour.

One criticism of the TRA, however, is that intention is not always predictive of behaviour. This is due to situational factors, which may deflect the adolescent from acting consistently. The behaviour must be negotiated with another person, and negotiation over the use of condoms does not lend itself to deliberate, rational thinking and action. Therefore, the dynamics of heterosexual relationships must be taken into account (Ingham, Woodcock & Stenner, 1991). In addition, consistency of intentions may vary in circumstances where alcohol or other substances might impair judgement. It has been concluded that the TRA works relatively well in predicting behaviours that are premeditated and rationally governed, but it is less successful in explaining actions in which contextual and emotional factors play a major role (Moore et al, 1996).

1.3.3. Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) is an extension of the Theory of Reasoned Action. The theory asserts that people are motivated to behave a certain way to the extent that they have a positive attitude toward the behaviour, feel social pressure to behave in a certain way and perceive self-control over the behaviour. Perceived behavioural control is defined as the

perceived ease versus difficulty of performing the behaviour - it reflects past experience and anticipated impediments, resources and opportunities (Jemmott, 1996; Moore et al, 1996).

Rannie and Craig (1997) found that despite having positive attitudes, feeling social pressure, and perceiving behavioural control, a significant proportion of sexually active adolescent female Sexually Transmitted Infection (STI) clinic attendees did not intend to use condoms consistently in the next three months. They concluded that this finding called the validity of the model into question.

In terms of actual condom use, Reinecke, Schmidt and Ajzen (1996) found that 63.9% of the variance in condom use in the second wave of a panel study among German youth was accounted for by the intentions and perceived control measured in the first wave. However, only 30% of the variance in intentions was explained by attitudes, norms and perceived control. When including past behaviour 83.8% of the variance in intentions of the second wave was accounted for. Therefore, past behaviour appears to have a direct effect on later intentions, unmediated by attitudes, norms or perceived control.

Boldero, Moore and Rosenthal (1992) found limited support for the TPB in a sample of Australian undergraduate students. Intentions to use a condom measured some time before and immediately prior to a sexual encounter were direct predictors of condom use. However, communication, sexual arousal and condom availability were also predictors of condom use.

The correlation between initial and later (at the time of the next sexual encounter) intentions appears to be unstable. Contextual and situational features (communication with partner, type

of partner, alcohol use, level of sexual arousal and condom availability) are important predictors of the intention to use a condom and actual condom use at the time of the sexual encounter. Therefore, this model may be useful in predicting behaviours over which the individual has personal control. For example, while taking a contraceptive pill is a private matter and not initiated during the sexual encounter, this does not apply to condom use (Boldero et al, 1996).

1.3.4. The AIDS Risk Reduction Model

The AIDS Risk Reduction Model (ARRM) integrates concepts from the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour and self-efficacy theory, with concepts such as emotional influences and interpersonal processes (Boyer & Kegeles, 1991).

The ARRM postulates three distinct points in the process of changing or reducing sexual risk-taking behaviours. Firstly, the individual recognises that their current sexual behaviour carries a risk of HIV infection. The recognition of risk is affected by knowledge, perceived personal susceptibility, stereotypical thinking about the types of people who develop AIDS, acceptance of one's sexuality, egocentrism and social norms about what constitutes risky behaviour. Secondly, the individual makes a decision to alter high-risk behaviour. Commitment to a decision is dependent on attitudes to low and high-risk activities (a cost - benefit analysis) and on perceived self-efficacy. The third point is overcoming barriers to implementing the decision. Actual behaviour change is enhanced by sexual communication skills and social support to reduce risk behaviour (Boyer & Kegeles, 1991).

Although the ARRM was designed to predict adult sexual risk behaviour, Breakwell, Millward and Fife-Schaw (1994) have tested it on data collected from a sample of 16 -20-year olds in London. The model accounted for 30% of the variance in condom use. It appears that social representations that embody normative and value considerations underlie commitment to safer sex and override intentions in the explanation of prospective behaviour.

1.4. Limitations of the current models used to understand adolescent safer sex behaviours

From the outline given above it is clear the contextual framework of youth reproductive behaviour that has been most frequently overlooked. The decisions that adolescents make about their sexuality, the behaviours they engage in and the values and attitudes they hold are all shaped by their life histories, personal qualities and social environments. Although the influence of social context on individual behaviour is recognised to an extent by the theories outlined above (e.g., perceived social norms are assigned a key role in both the Theory of Reasoned Action and the Theory of Planned Behaviour), other aspects of social influence are dealt with less explicitly and systematically (Rhodes & Malotte, 1996).

Rhodes and Malotte (1996) recognised that, in addition to considering social norms, it is also desirable to include variables such as social support and social networks as factors in the process of individual behaviour change. Social support is the interactive communication process that alters the affective, cognitive or behavioural state concerning a particular situation. Supportive social relationships serve to reduce uncertainty about the situation and the self and function to enhance the perception of personal control. The influence of peers can be especially

significant in determining the degree to which an individual perceives a given behaviour as normative as well as how much support for the performance of these behaviours they perceive. Social support has an effect on perceived social norms, normative beliefs, perceived self-efficacy and attitudes and behavioural beliefs (Rhodes & Malotte, 1996).

Social networks can affect individual behaviour through social support and through environmental facilitators and barriers (e.g., condom availability). The social network structure can also influence the strength of normative beliefs by enhancing or inhibiting the individual's willingness to comply with the perceived behavioural preferences of significant others (Rhodes & Malotte, 1996).

1.5. The current study

Using Jessor's (1992) psychosocial framework for understanding risk behaviour in adolescence, the study aims to examine the factors or domains that influenced condom use at last sex among black urban adolescents. Within this framework biological factors, the social context, the perceived environment, personality and other behaviours were all thought to impact directly on condom use as separate domains. They were also thought to have indirect effects on condom use through the interaction of these domains. Chapter Two contains a more detailed outline of the psychosocial framework adopted and a description of current research within each of the domains.

The theory was tested using data collected in July 1995 during a survey of reproductive health issues among urban black youth in three cities in South Africa. The available data allowed a

number of variables within each domain to be tested. A brief outline of the variables within each domain appears below.

Within the biological domain, age and gender were included in the model. The social context was separated into the proximal context of the family and the more distal context of school and health services. In the proximal social context, family structure, parental levels of education and communication about sexual matters with adolescents were included. The distal social context consisted of the level of sex education and the promotion of condom use by a health professional.

The perceived environment was analysed in terms of the individual and peers. A measure of the individual's perceived environment was made up of variables measuring knowledge, the perception of risk and the perception of barriers. A measure of the perceived environment of peers was made up of the perception of peer condom use and the perception of peers as affected by the consequences of unprotected sex, *viz.* pregnancy and STIs.

The personality domain contained variables measuring future educational and career orientation, self-esteem, locus of control and fatalism.

General behaviours expected to impact on condom use were measured by the frequency of church attendance and engagement in other risk taking behaviours, such as smoking cigarettes and alcohol and drug use. Sexual behaviours thought to impact on condom use were discussion of protection with a partner, the use of non-barrier methods of birth control and number of sexual partners.

Binary logistic regression models were used to separately assess the impact of each domain on condom use. A method of loglinear model selection was then used to determine interaction across the domains of predictors that significantly impacted on condom use at last sex. Chapter Three contains a detailed description of the variables and the statistical analysis. The results of this analysis appear in chapter Four and a discussion of their meaning appears in chapter Five.

2. Literature Review

2.1. A Psychosocial Framework for Understanding Risk Behaviour in Adolescence

Jessor (1992) proposed a psychosocial framework for understanding risk behaviour in adolescence. He began by noting that the use of the concept of risk up to that point had been essentially biomedical. The biomedical approach reflects a concern for adverse outcomes related to morbidity and mortality. Epidemiological research sought to locate agents or conditions that compromise health, the quality of life or life itself. These agents or conditions are referred to as 'risk factors', and the search for them has remained focused primarily on biology, with a limited focus on the physical environment and personality variables. More recently, as it has become increasingly apparent that the burden of disease can be linked to human behaviour and the social environment, the search for risk factors has expanded into the domain of the social environment and behaviour. An example is the contention that unprotected sexual intercourse may result in sexually transmitted infections or HIV infection.

The incorporation of behaviours into the rubric of risk factors entails a reformulation of thinking about what it is that is at risk. The traditional view of risk, as risk to biomedical outcomes alone, has changed to include an evaluation of the social and personal outcomes of behaviour in addition to its biomedical outcomes. A psychosocial understanding of risk - when behaviours are risk factors - requires paying attention to all their potential outcomes and consequences, not just to those that are biomedical (Jessor, 1992; 1993; 1998).

The restriction of outcomes of risk behaviour to adverse, negative or undesirable consequences is also challenged. Rather, when behaviours are risk factors, the notion of risk needs to be expanded to include low risk and protective behaviours. Research has shown that adolescent risk behaviours are functional, purposive, instrumental, and goal directed and that the goals involved are often those that are central in normal adolescent development. It is not difficult to see how smoking, drinking, illicit drug use or early sexual activity can be instrumental in gaining peer acceptance and respect, in establishing autonomy from parents, in repudiating the norms and values of conventional authority, in coping with anxiety, frustration and the anticipation of failure or in affirming maturity and marking a transition out of childhood towards a more adult status. These goals are characteristic of ordinary Western psychosocial development and their centrality helps to explain why risk behaviours that serve such functions might be intractable to change. In addition, research focused on a single variable such as self esteem, a single setting such as poor communities, or a single explanatory domain such as personality or genetic predisposition, has provided only a limited explanation of adolescent risk behaviour (Jessor, 1992; 1993; 1998).

In order to provide an explanatory account of complex social behaviour, Jessor recommends a move away from identified risk factors in order to establish a web of causation or an explanatory framework that can provide a logical account of the risk behaviours' antecedents (1992; 1993; 1998).

A comprehensive social-psychological framework for explaining behaviour generally includes four major explanatory domains: the social environment; the perceived environment; personality, and other behaviour. Although not traditional, more recent explanatory efforts

have increasingly included a fifth domain: the biological. These multiple interacting domains are known as the 'web of causation' (Jessor, 1992; 1993 & 1998).

Furthermore, within each of these domains, attention must be given to the protective factors derived from a resiliency framework - which posits that young people's vulnerability to health compromising outcomes is affected by both the nature as well as the number of stressors. In addition, due consideration should be given to the presence of protective factors that buffer the impact of those stressors. Two longitudinal studies by Werner and Smith (1992) and Quinton and Rutter (1988) have identified the role of the environmental and familial contexts as well as individual characteristics in promoting well-being among children who have experienced multiple life stressors.

Figure 1: A conceptual framework for adolescent risk behaviour: risk and protective factors, risk behaviours, and risk outcomes (Jessor, 1992, p.27)

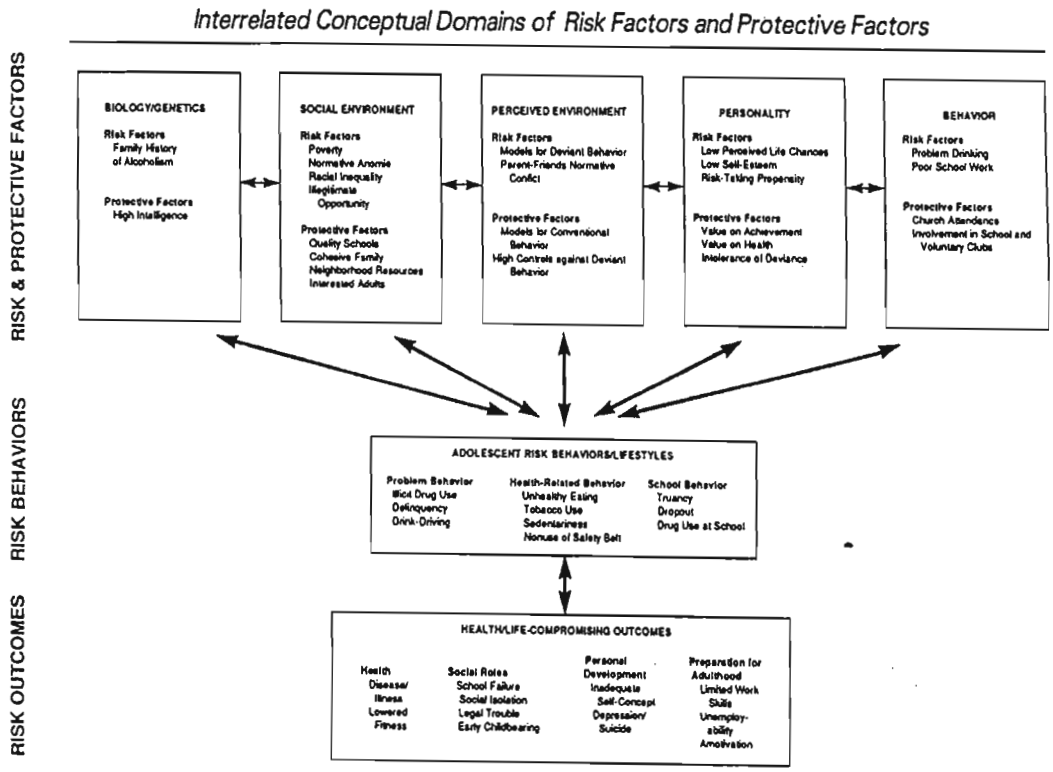

Figure 1 illustrates a model of inquiry that seeks to capture the bulk of the variance in adolescent risk behaviour. The most important of aspects of this model are:

- The model resists a focus on risk alone. Instead, it places an emphasis on protective factors - those personal, social and institutional resources that appear either to promote successful adolescent development or to buffer the risk factors.
- The model consists of five domains, biological factors, the social environment risk, the perceived environment risk, personality risk and behaviour.
- Each domain may be considered a separate source of risk.
- Each domain is represented as having direct effects on risk behaviour.
- The various risk domains are also represented as having indirect effects on risk behaviour - effects that are mediated through other risk domains. Therefore, beyond their direct effects, social environment risk factors such as poverty may influence the low perceived life chances risk factor in the personality domain and thereby indirectly influence risk behaviour (Jessor, 1992; 1993; 1998).

2.2. Review of the risk domains and condom use

Research on adolescent sexual behaviour within the developing world that focuses not on teenage pregnancy, but on the sexual behaviours that place adolescents at risk of HIV infection has been concentrated in knowledge, attitudes, practices and behaviour (KAPB) surveys. While these surveys provide valuable information, there is usually little attention to the societal, normative or cultural contexts within which adolescent sexual behaviour occurs (MacPhail, 1998). It was the aim of this thesis to develop a model of how the five risk domains influence condom use. The five domains were explained as being the biological, the

social context, the perceived environment, the personality and other behaviour. Therefore, it was necessary to review the literature on these concepts. Consequently, while much of the literature reviewed is based on studies conducted in the United States of America and other First World countries, the differences between such contexts and the South African context has been kept in mind. It should be noted that the studies in developed countries - studies that have been directed at particular adolescent groups believed to be at higher risk of HIV infection (such as homeless, incarcerated or delinquent adolescents) - are not reviewed here as the focus is on the general adolescent population.

2.2.1. Biological

The biological factors thought to impact on condom use are age and gender. One of the primary barriers to effective contraceptive use is the frequent mismatch between the cognitive developmental level of adolescents, strongly related to age, and the cognitive skills required in sexual decision making situations (Chilman, 1983; Gilcrest & Schinke, 1987, Hamburg, 1986; Jorgenson, 1981 in Holmbeck, Crossman, Wandrei & Gasiewski, 1994). In terms of gender, by definition the male condom is almost exclusively under the primary control of the male partner.

2.2.1.1. Age.

Research has produced contradictory results about the relationship between age and condom use. For example, cross-sectional studies have shown that condom use is associated with younger age among adolescent males attending a general adolescent clinic (Pendergrast, Durant & Gaillard, 1992) and both-sex African American youth (Reitman, St. Lawrence, Jefferson & Alleyne, 1996; St Lawerence,1993). Irwin and Shafer (1998) in their review of recent trends in sexual behaviour among American adolescents, noted that younger adolescent males were more likely to report condom use than older adolescent males

Romer, Black, Ricardo, et al (1994) found that condom use tended to decline with age. They noted that this was consistent with repeated findings of other research and offered three alternative explanations for this pattern. Firstly, they suggested that as adolescents age they find partners they regard as stable and feel less need for condoms. Secondly, that condom use interferes with sexual enjoyment and is difficult to maintain regardless of partner. Finally, they offered the possible explanation that educational and awareness campaigns were more successful among those who were just becoming sexually active. This would mean that this was a cohort effect and not a stable trend that adolescents undergo as they become more sexually experienced.

The latter explanation seems unlikely given the stability of this finding over a period of time - the cited research covers the period 1992 to 1998. The trend observed by Boyer and Kegeles (1991) fits the first and second explanation, i.e., that condoms and withdrawal [the withdrawal of the penis before ejaculation] are the most commonly used contraceptives at

first intercourse. However, as sexual experience increases, the use of oral contraceptives increases and condom use decreases.

In a panel study aimed at providing a history of change in condom use and high-risk behaviors of inner city youth at high risk of contracting HIV, however, the findings differed. Here it was found that overall, condom use increased with time and age (Stiffman, Dore & Cunningham, 1994).

2.2.1.2. Gender.

In all countries, young women face the highest risk of HIV infection through heterosexual contact. Women are more biologically susceptible to the transmission of infection than men - and adolescent girls are more susceptible than adult women. In Western Kenya, nearly one girl in four aged 15-19 years of age is HIV-positive, compared with 1 in 25 boys of the same age. In Zambia, in the same age group, 16 times as many girls as boys are infected. In rural Uganda, among 20-24-year-olds, six young women are HIV-positive for every one infected young man (Interactive Population Centre, 2001).

Over and above their biological, physical susceptibility to HIV infection, young women are constrained by the social construction of their gender, which affords them little power to negotiate condom use with sexual partners (Interactive Population Centre, 2001).

Donald, Lucke, Dunne, O'Toole and Raphael (1994) found, in their sample of 932 sexually active secondary school students, that boys were twice as likely as girls to have used a

condom at last sex. The explanation they offered for this was that the girls were not only more likely to have defined themselves as involved in steady, trusting relationships but were also likely to be using oral contraceptives to prevent pregnancy.

In a cross sectional study in Californian secondary schools, Leland and Barth (1993) found that males were more likely than females to have used condoms to avoid exposure to HIV. They indicated that as females had to rely on their ability to persuade their partners to use condoms and because of actual or perceived resistance, the lower incidence of condom use among females was unsurprising.

Both of these conclusions fit Breakwell's argument (1993, in Breakwell & Millward, 1997) that the acceptance of the social construction of the traditional female role of sexual passiveness and disinterest in sex impacts on safer sex behaviours. Young women are unlikely to engage in sexual practices that run counter to the behavioural possibilities prescribed by the social representation of traditional female sexuality. Therefore, assertion in a sexual situation and the negotiation of condom use would be proscribed.

Furthermore, research has found that women are more inhibited with respect to carrying condoms than men. Both men and women expect that the male partner should provide the condom (Gilmore, DeLamater, & Wagstaff, 1996). In addition if a woman, especially a young woman, takes condoms on a casual date, it contravenes the romantic code that sexual activity only occurs when a woman is carried away by love. It is often assumed that she is pre-meditating and self-initiating a sexual encounter, either presumption has the ability to negatively label her (Holland, Ramazanoglu, Scott, Sharpe & Thomson, 1992).

2.2.2. Social context

Jessor's framework did not differentiate between the proximal environment of the family and household, and the more distal environment of school and health services. The separation of social context into proximate and distal was based on general systems theory which posits that factors closer to the individual have a greater impact than those further away (Busch, 1979).

2.2.2.1. Proximate social context

The factors within proximate social context, impacting on condom use, are those that are related to the family:

- Communication between parents and adolescents on condom use.
- Family structure.
- Parental levels of education.

2.2.2.2. COMMUNICATION BETWEEN PARENTS AND ADOLESCENTS ABOUT SEX.

There is evidence that direct communication about sexuality in the form of discussions about sexual matters, sexual decision making and protection against STIs and pregnancy occurs sparingly between parents and their teenagers (Rosenthal & Smith, 1996). Parents are often uncomfortable discussing sexual topics with their children (Brooks-Gunn & Furstenberg, 1989) and, as such, usually play a minor role in the sex education of their children (Taris & Semin, 1997). In the South African context, there appears to be an inhibition of open

discussion about sexuality issues between parents and children - partly as a result of preconceived and stereotyped notions of what is appropriate for discussion between a parent and child. Parents may also fear that discussion may encourage sexual activity (NPPHCN, 1995). Mayekiso and Twaise (1993) found that a low percentage of black South African adolescent girls had received sexual information from parents. Furthermore, these authors noted that when this communication about sexual matters did in fact occur, many parents still believed that it was sufficient to discuss only menstruation with their daughters. This finding was supported by focus group discussions conducted by the NPPHCN (1995). It was found that when communication did occur it was nearly always mothers who talked to young girls about menstruation, and less frequently pregnancy. The manner of communication ranged from acknowledgement and reassurance to indirect messages and complete discomfort.

NPPHCN (1995) found that South African black male participants indicated that their parents never talked about contraceptives even when they knew that the boys had girlfriends. Female participants, however, felt that their parents automatically assumed they were sexually active if they had boyfriends. The girls spoke of being warned indirectly about pregnancy or being prevented from engaging in relationships. Furthermore, they indicated that communication with parents frequently only happened after pregnancy had occurred.

2.2.2.3. COMMUNICATION BETWEEN PARENTS AND ADOLESCENTS SPECIFICALLY ABOUT CONDOM USE

Moore and Rosenthal (1991) found that mothers' encouragement of their adolescents using precautions against AIDS was a significant predictor of condom use with casual partners for males. Leland and Barth (1993) found that sexually experienced students who reported

having done something to try to avoid exposure to AIDS versus those who had not, were more likely to have discussed a variety of sexual topics with their parents. These students were more likely to have ever, and always, used birth control, to have used birth control more frequently, to have had fewer pregnancies, used condoms and had fewer sexual partners.

Whitaker and Miller (2000), in a sample of 372 sexually active Black and Hispanic adolescents, found that parent-teen condom discussion was related to greater condom use at last intercourse, greater lifetime condom use and more consistent condom use. It should be noted that these findings were based on correlational data, so direction of causality cannot be determined.

2.2.2.4. FAMILY STRUCTURE

It has been estimated that approximately five million African children live in households affected by divorce. Only half of the young people surveyed by NPPHCN in 1995 lived with both parents (54.7%); 31.5% live with only one parent - usually their mother - and 13.8% lived with other people (NPPHCN, 1995). These figures are comparable to those found by Richter (1996).

Biglan, Metzler, Wirt, Ary, Noell, Ochs, French and Hood (1990) found that families in which parents are less available (single parent households, foster care, or households where no adults are present), were strongly associated with more sexual risk taking among sexually active adolescents and with less condom use. Low levels of parent availability was also associated with less prosocial behaviour, more smoking, alcohol use, illicit drug use and

having more friends who engage in problem behaviours. Jemmott and Jemmott (1992) found, in their sample of inner city black male adolescents, that adolescents who lived with both parents reported significantly more consistent condom use in the past year. They were significantly less likely to report fathering a pregnancy compared to adolescents who did not live with both parents. Secondary school males in Peru were also more likely to have used a condom during first sexual intercourse and at the most recent or last sexual intercourse if they lived with both parents (Magnani, Seiber, Zielinski Gutierrez & Vereau, 2000).

2.2.2.5. PARENTAL LEVELS OF EDUCATION

Kirby (1999) cites two studies (Brewster et al, 1998; Murphy & Boggess, 1998) both of which found that when parents had a higher level of education, adolescent condom use was more likely.

2.2.2.6. Distal social context

The distal social context factors considered in this study are:

- School
- Health services

2.2.2.7. SCHOOL

A comprehensive sex education course has been defined as one in which no subjects are forbidden or censored, the course lasts the better part of the semester and teachers are free to respond to any questions which students might raise (Kirby, Alter & Scales, 1979 in Atwood

& Kasindorf, 1992). In South African schools, however, sex education is typically presented as a one off occurrence, with the information divided into sections on contraception, pregnancy, *etcetera.* This ignores the basic premise of learning, i.e., that information should be provided on a systematic, regular basis in order to reinforce learning (Atwood & Kasindorf, 1992).

In addition, schools and teachers are not always perceived as credible sources of sex-related information. Goldman and Goldman (1982, in Moore & Rosenthal, 1993) found that a lack of trust in teachers' knowledge or discretion served to inhibit many young people in Britain, Australia and America, from approaching their teachers for information or advice about sex.

Studies have shown that sex education does not stimulate sexual behaviour, nor do sexual behavioural patterns change much as a result of a single course (Kirby, 1985). Lief, Fullard and Devlin (1990), in a meta-analysis of the effectiveness of sex education, found that traditional sex education had no effect on sexual activity, contraception use, abstinence or teenage pregnancy. Weinman, Smith and Mumford (1992), in a sample of inner-city adolescent girls, found that although 63% of their 1989 cohort had AIDS education in school (in comparison to only 9% in 1986), there were no significant differences in knowledge, knowledge changes over time, or the number of sexual partners.

However, research from intervention studies has found that youth who have had a sex education course are more likely to delay sexual activity, to know about contraception, to use it more regularly and to use the more effective methods (Dawson, 1986).

Jack (1996), in an analysis of the South African Education Department's AIDS education programmes, found that:

1. None of the programmes attempted to establish the current levels of information, attitudes and behaviours of the students. This type of pre-intervention assessment could assist teachers in understanding normative beliefs and attitudes that inform safer sex behaviours.
2. Gender that militates, as a societal position, against safer sexual practices was not built into any of the programmes.
3. All the programmes located themselves within the ethos of a conservative sexuality, presenting not only marriage and children as the legitimate and necessary aim of every adult, but also the nuclear family as the only legitimate type of family structure.
4. While all of the programs offered extensive information on AIDS and HIV and how it is transmitted, none had the explicit aim of increasing students' perceptions of their own susceptibility to HIV/AIDS. This was the case despite the fact that every teacher interviewed as part of the study thought that their students believed it would never happen to them.
5. There was no effort made to change adolescents' attitudes towards condoms. Normative beliefs against condoms seem to stem from the fact that wanting to use a condom indicates lack of love and fidelity. The programs do not offer a deconstruction of these attitudes. Although the programs do indeed try to make students see that they do not have to follow the crowd and that they should resist peer pressure and make their own decisions, this was only in relation to abstinence from sex.
6. None of the programs offered information about condom use and where to obtain condoms.

Kirby (1997) reviewed the impact of middle school, high school and community based sexuality and HIV education programs specifically in terms of their impact on condom use. He found that some - but not all - programs increased condom use. Six of the nine programs reviewed significantly increased condom use. Dallimore (2000) found that those adolescents in KwaZulu-Natal who had low levels of exposure to all sex education topics were less likely to have used a condom at last sex than those who had higher levels of exposure.

2.2.2.8. HEALTH SERVICES

Stiffman et al (1994) examined the determinants of change in condom use by inner-city youths at high risk for contracting HIV. The participants were interviewed four times between 1984-85 and 1991-92 in order to provide a history of change in condom use and high-risk behaviors. A negative association was found to exist between health clinic use and condom use. Although youth with high-risk behaviors made more clinic visits, those visits did not necessarily result in condom use.

In a series of focus group discussions, South African youth indicated that they were conscious of the fact that they would be defying social norms by being sexually active outside marriage. This increased their discomfort at accessing services that were staffed and utilized by adults. Many knew the clinics at which contraceptives are available but seldom attended them. The attitude of health workers was reportedly one of the main reasons why they avoided clinics. Clinic staff told young people that they are too young to have sex and therefore should not use contraceptives. A serious lack of privacy during consultations was also reported (NPPHCN,

1995).

One study undertaken by Abdool Karim, Preston-Whyte and Abdool Karim (1992b & 1992c) highlighted a number of difficulties which adolescents face in going to clinics to obtain condoms. Some clinics were difficult to locate and adolescents were embarrassed to ask directions to a 'family planning' clinic. Once there, they were often not offered any privacy and the young people did not feel comfortable asking for condoms in front of other patients. Very seldom were any verbal instructions given on how to use condoms, even when asked, as the clinic staff believed that the attached written instructions were sufficient. Only on a few occasions did any of the staff offer information and advice on HIV/AIDS. Condoms were perceived as an inferior and unsafe method of contraception and their use was discouraged.

The negative aspects of government health care services, HIV/AIDS and the promotion of condom use are not confined to general clinics. In a recent South African assessment of care provided by a government STI clinic in Cape Town, it was found that only 21% of male and 37% of female patients received any education about STI transmission during the clinic visit, and that only 25% of male and 36% of female patients received education about condom use (Mathews, van Rensburg, Schierhout, Coetzee, Lombard, Fehler & Ballard, 1998).

2.2.3. Perceived environment

The perceived environment was separated into the individual's perception of their environment and their perception of the environment as it related to their peer group.

2.2.3.1. Perceived environment - self

The perceived environment in relation to the self includes the factors:

- Knowledge
- Personal risk perception
- Perception of barriers to protective behaviours

2.2.3.2. KNOWLEDGE

While knowledge is necessary for behaviour change to become possible, it has little effect on its own in significantly shaping behaviour. Research has indicated that despite the fact that young people are aware of the risks and that they know about protective behaviours, they continue to engage in risky sexual activities (Huerta-Franco, de Leon & Malacara, 1996; Keller, Bartlett, Schleifer & Johnson, 1991; Shoop & Davidson, 1994; Vogels, van-der-Vliet, Danz & Hopman-Rock,1993).

Similarly, in South Africa, Matthews, Kuhn, Metcalf, Joubert and Cameron (1990) found that among township school students in Cape Town only 15.4% of those who had sex and knew that condoms prevent AIDS had ever used a condom.

2.2.3.3. PERSONAL RISK PERCEPTION

Malavaud, Dumay and Malavaud (1990) found that use of condoms appeared more likely if students felt personally at risk. DiClemente, Forrest and Mickler (1990) found that perceived susceptibility and fear of AIDS are associated with a decrease in the number of sexual partners and an increase in condom use among college students. Donald et al (1994), in a probability-based survey of students attending 72 public secondary schools in Australia, found that among the 932 sexually active students, both males and females who perceived themselves to be at higher risk of HIV/STD infection were more likely to have used a condom at last sex.

However, Stanton, Li, Black, Ricardo, Galbraith, Feigelman and Kaljee (1996), in a cohort study of 119 African American youth from low-income public housing, found that perceptions of vulnerability to STI and HIV infection at the time of the initial interview had not influenced condom use six months later.

Further, St. Lawrence, Brasfield, Jefferson, Allyene and Shirley (1994) noted that the African- American youth from low-income communities in their sample did not perceive themselves to be at risk regardless of their actual behaviour. Furthermore, they noted that this resistance to risk perception had been reported in a number of other studies and that adolescents typically believe that risk is something that affects only others (St Lawrence et at, 1994). This sense of invulnerability among adolescents was described by Elkind (1985, cited in St Lawrence, 1994) as a 'personal fable', reflecting the distorted belief that no harm can befall the individual as they are fundamentally different from others. Serovich and Greene

(1997) noted that, while the personal fable has been conceptualized as a developmental phenomenon that decreases throughout adolescence, it was in fact predictive of an increased number of sexual partners among college students.

Bandawe and Foster (1996), in a sample of Malawian secondary school students, noted that while the behaviour of urban males placed them at risk, these subjects perceived themselves the least at risk and reported lowest condom use. The authors suggested that a degree of compliance with some recommended ways of preventing AIDS (for example limiting the number of sexual partners) created a sense of false security amongst them.

2.2.3.4. PERCEIVED BARRIERS TO PROTECTIVE BEHAVIOURS

One of the major obstacles to condom use is the unavailability of a condom (Hammer, Fisher, Fitzgerald & Fisher, 1996; Holland et al, 1992; NPPHCN, 1995). Rosenthal, Moore and Flynn (1991) found that young people felt that they were unable to carry condoms around with them 'in case', reflecting the attitude that to be prepared in this way would invite being labeled as being promiscuous. Loxley (1996) confirmed this when she found that young men as well as young women were concerned that carrying condoms would tarnish their sexual reputations. Two fifths of the women in her study believed that men would construe women carrying condoms in a negative light, with many of them saying that men would think they were 'sluts'. Nearly three tenths of the men believed that women viewed male condom carrying in a negative light. One of the respondents commented that women thought men who carried condoms were 'bloody sleazy little animals' (p.296).

The non-use of contraceptives and condoms has been identified as a result of:

- not expecting to have sexual intercourse (Wight, 1992).
- the use of alcohol or drugs (Hammer et al, 1996; Wight, 1992).
- the belief that it is wrong to use contraceptives (Wight, 1992).
- embarrassment at asking for condoms in public places or when buying condoms (Holland et al, 1992).
- fear of parents/ peers finding contraceptives / condoms (Holland et al, 1992; NPPHCN, 1995).
- difficulties in using condoms, i.e., awkwardness in putting them on and removing them (Madu & Peltzer, 1999; NPPHCN, 1995; Wight, 1992).
- a reduction in the 'spontaneity' of the sexual act (Hammer et al, 1996; Wight, 1992).
- a reduction of sensation/ sensitivity (Abdool Karim et al, 1992a; Gilmore et al, 1996; Hammer et al, 1996; NPPHCN, 1995; Wight, 1992).
- experiencing pain or discomfort (Loxley, 1996; NPPHCN, 1995).
- unreliability of condoms (Hammer et al, 1996 Loxley, 1996; Wight, 1992).
- negative attitudes towards condoms (Richter, 1997).

2.2.3.5. PARTNER

One's partner objecting to the use of condoms and the fear of one's partner's response to a request to use condoms are significant barriers to protective sexual behaviours (Richter, 1997; Wight, 1992). The basis of these real or imagined objections seems to be the implications of a lack of trust in one's partner (NPPHCN, 1995). Thirty six focus groups, involving 650

black South African high school students revealed that condom use indicated a lack of trust in the partner's faithfulness (Abdool Karim et al, 1992a).

Hammer et al (1996) found that more than half of the particpants in their focus group discussions made it clear that if their partner asked them to use condoms after they had *not* been used, they would be suspicious and mistrustful and wonder about the partners motivation for making such a request. This is supported by Gilmore et al (1996) who found that some of their participants felt that a woman who asks a man to use a condom is either infected with an STI or believes that he is infected with a STI.

Within the South African context, many adolescent girls pointed out the difficulties not only of discussing AIDS within their relationships but also of changing their behaviour and of communicating with their partners about condom usage (NPPHCN, 1995). A number of young South Africans cited the value of a monogamous relationship in protecting oneself from AIDS and, as such, only 59% of the sample thought that it was necessary to protect oneself from HIV infection with a regular partner. The reasons given as to why protection was not necessary at all revolved around trust and monogamy (Richter, 1997).

Moore and Rosenthal (1991b) found that it was only among young women that negative attitudes to precautions and risky behaviour were related. Risk within regular and casual relationships and multiple partnering were all associated with females' negative attitudes to taking precautions against AIDS. Since condom use is less likely to lead to a reduction in the physical sensations of sex for females, this may reflect their sensitivity to the relationship aspects of the sexual encounter, such as concern for a partner's pleasure. There is a negative

association between an anti-precautionary attitude and number of partners for males. This may be because having more partners has given these individuals more experience with using condoms with the result that the benefits have become manifest.

2.2.3.6. Perceived environment – peers

Romer et al (1994) found that young adolescents were more likely to use condoms if they believed that their peers used them. They found that the decrease in motivation to use condoms among older adolescents was more pronounced when peer norms are less favourable for condom use. Another study found that adolescents were twice as likely to use condoms if they believed their peers also used condoms (DiClemente, 1990). Donald et al (1994), in a survey of 932 sexually active Australian secondary school students, found that for both males and females, the perception that more peers use condoms was a significant predictor of condom use at last sex. Stanton et al (1996), in a cohort study of 119 African American youth, found that perceived peer condom use at one particular time was strongly predictive of condom use six months later. Boyer, Tshann and Shafer (1999) found that the perception that friends support preventative health behaviours was associated with adolescents' recent use of condoms.

Whitaker and Miller (2000) found, in a sample of 372 sexually active Black and Hispanic adolescents, the perception that many of their peers used condoms was indicative of an increased likelihood that they themselves would report condom use. In fact, these adolescents reported greater condom use at first intercourse, more condom use at most recent intercourse, greater lifetime condom use and greater consistent condom use. It should be noted that these

findings were based on correlational data and for this reason the direction of causality could not be determined.

It would seem likely that adolescents who have peers who have experienced the negative consequences of unprotected sex would be more likely to engage in protective behaviours. In his review, however, Kirby (1999) noted that adolescents at risk are more likely to have peers who have become pregnant. Preston-Whyte (1999) noted that the pervasive value placed on children and evidence of fertility within the South African context is not limited to adults, but is apparent amongst the peers of adolescents. She illustrated this point with a quote, "Most of my friends have babies or their older sisters had them – it is lonely not to have one too and even most of the school leavers have a baby" (Preston-Whyte, 1999, p. 151).

2.2.4. Personality

Personality factors associated with condom use are:

- Locus of control
- Goal-setting
- Self-esteem
- Fatalism

2.2.4.1. Locus of control

Individuals who endorse internal control statements perceive the course of their lives and their fate as amenable to personal control and, by extension, should be more likely to plan and

take actions to cause events to go as they wish. Individuals with an external locus of control believe that forces outside themselves are more powerful factors in determining what happens in their lives and should therefore be less inclined to take personal action (Morrison, 1985). Tashakkori & Thompson (1992) found that a higher level of internality, as measured on the Multidimensional Health Locus of Control scale, was associated with intent to perform AIDS preventative behaviours. Cole and Slocumb (1995) found that an internal health locus of control was a significant predictor of safer sex behaviours among male college students. In a sample of low-income African American adolescents, St. Lawrence (1993) found that if the individual had an internal health locus of control and if the individual believed they retained self-control in sexual situations, condoms were used more often during sexual activity.

2.2.4.2. Goal setting

It would seem likely that adolescents who have higher educational and career goals would be more likely to engage in protective health promoting behaviours. In her review of future orientation and educational aspirations, Morrison (1985) concluded that this factor was related positively to contraceptive use.

Preston-Whyte and Zondi (1991) argue that within the South African context there is little for many black girls to look forward to except childbirth. Professional training and interesting jobs are limited and having a baby may seem an exciting distraction from the dull routine of domestic and service work. "Childbirth confers on girls the valued status of motherhood and it may be the pathway to adulthood in cases where marriage is delayed by lack of money..." (Preston-Whyte & Zondi, 1991, p. 1391). However, the NPPHCN (1995) focus groups found

that one of the reasons given by adolescents for using contraception was the wish to complete their education.

Agnew and Loving (1998) found that males (but not females) who were future-oriented individuals were more likely to possess a positive attitude toward condom use, express a greater intention to use condoms and report greater frequency of lifetime condom use.

2.2.4.3. Self-esteem

Self-esteem is considered a pre-requisite to the adoption of healthy behaviours as young people cannot be expected to choose such behaviours if they do not possess a strong sense of personal worth. Although this idea has intuitive appeal there are few studies investigating the relationship between self-esteem and HIV prevention (Cole & Slocumb, 1995). The relationship between self-esteem and the use of contraceptives has received more attention. In a review of adolescent contraceptive behaviour, Morrison (1985) concluded that self-esteem has been associated with contraceptive efficacy in contradictory ways. Herold et al (1979, in Morrison, 1985) found support for their hypothesis that women with higher self-esteem are able to acknowledge their sexual behaviour and therefore need less social approval. As a result they are better able to obtain and use contraceptives. Contrary to this, however, the other four studies reviewed on this topic found no relationship between self-esteem and contraceptive use.

Three studies focusing specifically on condom use are reviewed. Tashakkori and Thompson (1992) reported a statistically significant relationship between self-esteem and intent to

perform AIDS preventative behaviours among black college students. Higher self-esteem among Peruvian secondary school males was, however, associated with a lower likelihood of using condoms (Magnani et al, 2000). The authors suggested that this might likely be the result of social convention, where sexual relations are accepted and even encouraged for male adolescents. Due to this, having sex would tend to reinforce self-esteem among Peruvian adolescent males. Cole and Slocumb (1995) also reported this unexpected relationship between self-esteem and safer sexual behaviour among heterosexual male undergraduate university students in New England. They found that male college students who practice safer sexual behaviors possessed lower levels of self-esteem. They suggested that those high in self-esteem could risk being rejected by a potential partner for not practicing safer sex, while those low in self-esteem would not risk rejection and would therefore practice safer sex.

2.2.4.4. Fatalism

Moore and Rosenthal (1991b) found that fatalism (the belief that one's actions are unlikely to influence outcomes) affected males and females equally with respect to their attitudes about AIDS precautions. For males, fatalism was associated with risk taking behaviour. Young men with more partners and those who took more risks with their casual partners, expressed more fatalistic attitudes towards AIDS.

Leclerc-Madlala (1997) conducted open-ended semi-structured interviews with 100 Zulu-speaking youth between the ages of 18 and 25 years. The key finding was that "Knowing that one is infected with the AIDS virus was accepted not only as a death sentence but also as a

passport for sexual license.... young people express a desire to share the burden of the disease, and this is believed possible by spreading the virus to others" (Leclerc-Madlala, 1997, p.369).

Furthermore, many of the youth were convinced that if they were not yet already carrying the virus that it would just be a matter of time before they were infected. They were quite confident that many of their peers had already contracted the virus. As one of the participants pointed out, "They... won't use a condom because you will suspect. They just want to enjoy themselves and still feel good. I would do it that way. That's how we all feel" (Leclerc-Madlala, 1997, p.369).

2.2.5. Behaviour

In Figure 1, church attendance and alternative risk-taking behaviours are the general factors thought to impact on sexual risk behaviour.

2.2.5.1. Church attendance

Boyer and Kegeles (1991) noted that one of the precursors to effective protective strategies was the acceptance of one's sexuality. They noted that adolescents who felt guilty about their sexual activity were less likely to engage in effective strategies for protection than those who did not feel guilty. DuRant and Sanders (1989) argued that the frequency of attendance at religious services was an indicator of the amount of time that an adolescent was exposed to social influences that do not support premarital sexual activity. In their view, among sexually

active adolescents, the greater the participation in religious activities, the less likely they are to harbor sexual values and norms that agree with their sexual behaviour. Given that there is no congruence between sexual values and sexual behaviour, the adolescent is unlikely to plan for sexual intercourse by obtaining condoms and discussing protection with their partner, and are subsequently less likely to use condoms.

Zaleski and Schiaffino (2000) measured the degree to which religious identity acts as a protective buffer against sexual risk-taking in late adolescence among 230 first-year college students. The Allport and Ross Religious Orientation Scale was used to examine the relationship between religiosity, sexual activity and condom use. The results indicated that greater intrinsic and extrinsic religiosity was associated with less sexual activity and condom use. The authors concluded that religious identification may protect against initiating sexual activity among late adolescents but may fail to protect against practicing unsafe sex among students who are already sexually active.

2.2.5.2. Risk taking

In their review of the literature around risk taking and contraceptive use, Fortenberry, Costa, Jessor and Donovan (1997) noted that a single common factor, reflecting a dimension of psychosocial unconventionality, seems to underlie the various problem behaviours. These behaviours were defined as delinquency, problem drinking, use of marijuana and other illicit drugs, and early sexual intercourse. Furthermore, problem behaviours covary with health protective behaviours, physical exercise and seatbelt usage.

Contraceptive behaviour seems to have elements consistent with both problem behaviour and health protective behaviour. Earlier first intercourse is associated with greater psychosocial unconventionality and greater involvement in other problem behaviours. Attempts to avoid too-early pregnancy and childbearing by using contraception could, however, be viewed as prosocial conventional behaviour. In the same sense, condom use as a protective measure against STI and HIV infection - both for the individual and their partner - could be understood as prosocial (Fortenberry et al, 1997).

A negative association between regular contraceptive use and adolescents' involvement in problem behaviours is supported by most studies (Brown, DiClemente & Park, 1992; Costa, Jessor, Fortenberry & Donovan, 1996; Galavotti & Lovick, 1989; Hingson, Strunin, Berlin & Heeran, 1990; Richter, Valois, McKeown & Vincent, 1993 in Fortenberry et al, 1997). Substance use, especially alcohol use, displays a strong association with risky sexual behaviours - including failure to use contraception or condoms (Fortenberry, 1995 in Fortenberry, 1997).

Adolescent contraceptive and condom-using behaviour can mediate the risk of adverse health consequences of sexual activity and, as such, suggests relations with other health-protective behaviours. Empirical findings have, however, been mixed (Costa et al, 1996; Galavotti & Lovick, 1989; Richter et al, 1993 in Fortenberry, 1997). Choquet and Manfredit's (1992) study of 4255 urban French adolescents confirmed the relationship between smoking, drinking and/or illicit drug taking on the one hand and sexual activity on the other. They nonetheless concluded that contraceptive use is not related to problem behaviour and that sexual activity and contraception are not related to the same factors and do not have the same significance. This was supported by Fortenberry et al (1997), which concluded that contraceptive behaviour was

directly connected to health protective behaviours rather than to problem behaviours.

Biglan et al (1990) found clear evidence that adolescents are more likely to engage in high-risk sexual behaviour, specifically in terms of condom use when they are engaging in other forms of problem behaviour - including cigarette smoking, alcohol use and illicit drug consumption. In particular, cigarette smoking was a strong and independent predictor of high-risk sexual behaviour.

2.2.6. Behaviour – other sexual behaviours

The second behaviour domain concerns, specifically, sexual behaviours which may influence condom use.

2.2.6.1. Discussions with partner

Boldero et al (1992) found that communication with a partner was a significant predictor of condom use among Australian adolescents. Donald et al (1994), using a similar sample, replicated this finding. It was found that boys and girls who had talked to their partner about issues relating to sex and HIV/ STD avoidance, were more likely to have used a condom at last sex.

Shoop and Davidson (1994) reported that participants' ability to communicate with a sexual partner about AIDS-related issues was associated significantly with condom use among American adolescents. Those adolescents who felt able to communicate with a sexual partner

were 10.2 times more likely to have reported using condoms than those who felt hesitant about such communication. Ford and Norris (1995), in a household probability sample of African American and Hispanic adolescents and young adults, found that those who communicated with casual partners about condom use were more likely to have used a condom.

Within the South African context, Varga (1997) undertook qualitative research on adolescents from KwaZulu-Natal. She found that levels of communication within relationships were very poor. This was especially true with respect to issues regarding HIV/AIDS. Fearing violent retribution, few females felt that they could broach the topic with their partners. Instead, they merely hoped that their partners were behaving responsibly with other partners. This finding was supported by other qualitative studies that concluded that many women, particularly teenagers, fear ridicule and even violence if they try to initiate intimate discussions let alone insist on safer sex (Preston-Whyte, 1999). In the NPPHCN (1995) focus groups with South African adolescents, many girls raised the difficulties of discussing AIDS within their relationships, of changing their behaviour and feeling unable to communicate with their partners about condom usage.

Cline et al (1992, in Seal & Palmer-Seal, 1996) noted that amongst partners who reported discussing sexual topics, few reported talking about topics directly relevant to risk reduction within their own relationship (such as condom use). Safer sex talk between partners often consisted of general discussions about AIDS-related topics, rather than issues specific to their own relationship. Catania (1989, in Shoop & Davidson, 1994) reported that the perceived ability to communicate about these general sexual matters with a partner was, however,

unrelated to condom use. The perceived ability to express a specific desire for condom use was associated with more frequent use.

Wight (1992), in a review of AIDS-related qualitative research, states that in the sexual encounter there tends to be very little verbal communication during the transition from the possibility of sexual intercourse to it becoming a reality. In fact, ambiguity is often deliberately maintained in case either partner rejects further progress. This makes it virtually impossible for potential sexual partners to get to know each other's sexual histories and it constrains the negotiation of sexual behaviour.

Ingham et al (1991) found that where discussion had taken place prior to intercourse, it had been motivated more by personal feelings, or by relationship issues, than by the fear of infection. For those young women who *are* able to discuss sex, the negotiation of the relationship may increase trust but obscures any real risks which exist and may lead to greater risk taking in sexual relationships (Holland et al, 1992). Both men and women in Seal and Palmer-Seal's (1996) sample reported widespread dishonesty in disclosure of their own sexual histories to their partners.

Hammer et al (1996) concluded that the discussion of sexual matters does not usually begin until partners feel comfortable talking to each other about such topics. However, this level of comfort may not be reached until long after a sexual relationship is well established. Communication occurs in such a way as to enhance trust, not to undermine it. Thus, both partners may avoid discussions that are perceived to decrease certainty and intimacy. Even when issues of HIV are discussed, they may feel constrained to unconditionally accept

everything their partner says in order to demonstrate their trust.

2.2.6.2. Contraceptive use

Plichta, Weisman, Nathanson, Ensminger and Robinson (1992) found that being a consistent pill user significantly reduced the odds of consistent condom use. St. Lawrence (1993) found that the pill was the most preferred contraception for females, while the condom was preferred by boys. She suggests that this may be because each sex opts for a method within their own control. The most commonly cited reason for using a particular method was pregnancy prevention, followed by STI prevention and finally AIDS prevention. Critelli and Suire (1998) found a majority of participants indicated that they were less likely to use a condom if they were in a monogamous relationship and other forms of birth control were being used.

2.2.6.3. Number of partners

Risk for HIV/AIDS increases based on the number of sexual partners of unknown serostatus with whom the individual engages in unprotected sex (Rotheram-Borus, Mahler & Rosario, 1995). Therefore, it seems likely that adolescents who have had a greater number of sexual partners would be more likely to use condoms than those who had fewer partners.

However, this assumption was not proven in the studies reviewed. Lugoe, Klepp and Skutle (1996) found that having only one sex partner was significantly associated with increased condom use at last sex among secondary school students in Tanzania. Biglan et al (1990) found that adolescents with a greater number of partners in the last year were significantly less likely to use condoms. Dankoski, Payer and Steinberg (1996, cited Brown et al, 1992), in their review of the literature of adolescent sexuality showed that adolescents who had had more lifetime sexual partners and concurrent multiple partners were the least likely to use condoms.

Donald et al (1994) highlighted the fact that the adolescents in their sample with a greater number of sexual partners in the last year were no more likely to have used a condom than those adolescents with a lower number of sexual partners. They noted that this finding was consistent with other research among school students and adolescents that found that those most at risk were no more likely to use condoms. Indeed, in some cases they would be less likely to use condoms.

2.3. Summary

This chapter reviewed a number of factors thought to impact directly on condom use within each of Jessor's (1992; 1993; 1998) risk domains. Within the biological domain, research that examined age and gender was reviewed. Based on these studies, it can be concluded that younger adolescents are more likely than older adolescents to use condoms, and that male adolescents are more likely than female adolescents to use condoms.

The social context was separated into the proximal context of the family and the more distal context of school and health services. In the proximal social context, family structure, parental levels of education and communication about sexual matters with adolescents were included. It may be concluded, on the basis of the studies reviewed, that adolescents from intact two-parent homes are more likely to use condoms than adolescents living in single parent homes or without either parent. Adolescents who have parents with a higher level of education are considered more likely to use condoms, as are adolescents who had parents who communicate with them about sexual matters.

The distal social context consisted of the level of sex education and the promotion of condom use by a health professional. The literature reviewed suggests that adolescents who are exposed to sex education in school are more likely to engage in protective behaviours than those who do not receive sex education. Although the studies on health services reviewed indicated poor service delivery by health professionals, it is assumed that adolescents who have contact with a health professional who promotes condom use are more likely to use condoms.

The perceived environment was reviewed in terms of the individual's knowledge levels and perception of risk and barriers, and in terms of their perception of peer behaviour. Although the studies reviewed concluded that knowledge was unrelated to protective behaviour, it is assumed that a degree of knowledge regarding the risks of unprotected sex and what constitutes safer sex behaviours is required before such behaviours may be possible. Further, adolescents who perceive themselves as at risk of these negative consequences, and who perceive fewer barriers to condom use, are more likely to use condoms.

With the perceived environment of peers, the perception of peer condom use and the perception of peers as affected by the consequences of unprotected sex, *viz.* pregnancy and STIs were the factors reviewed within this domain. It may be deduced from the studies reviewed that adolescents who perceive their peers as using condoms are more likely to use condoms. Logically, it may be inferred that adolescents who perceive their peers as affected by the negative consequences of unprotected sex would be more likely to use condoms.

The personality domain contained variables measuring future educational and career orientation, self-esteem, locus of control and fatalism. The research reviewed indicates that adolescents who use condoms are more likely to be future orientated, have a higher self-esteem and an internal locus of control. The studies focusing on fatalism have shown that adolescents with a more fatalistic outlook are less likely to use condoms to protect against STI and HIV infection.

Within the general behaviour domain, studies focusing on the frequency of church attendance and engagement in risk taking behaviours, such as smoking cigarettes, alcohol and drug use, were reviewed. From these studies, it may be concluded that adolescents who frequently attend church are less likely to use condoms, as are adolescents who engage in other risk taking activities.

Within the sexual behaviours domain, the factors reviewed were discussion of protection with a partner, the use of non-barrier methods of birth control and number of sexual partners. Based on the literature, it may be expected that adolescents who have discussed protection

with a partner are more likely to use condoms. It may also be concluded from the studies reviewed that adolescents who use other methods or non-barrier birth control are less likely to use condoms, as are adolescents who have had more sexual partners.

3. Method

3.1. Aims and Objectives

The aims of the study were to examine the following:

1. The impact of each risk domain as a whole on condom use at last sex.
2. Possible interactions between the significant factors or variables within the risk domains which impact on condom use at last sex.
3. The impact of interactions between the significant factors or variables within the risk domains on condom use at last sex.

3.2. Data collection

The data was collected in July 1995 during a survey of reproductive health issues among urban black youth in three cities in South Africa. The survey was commissioned by the Society for Family Health and conducted by CERSA in conjunction with the Institute of Behavioural Sciences (University of South Africa) and other regional organisations concerned with youth reproductive health issues. The project was led by Dr. Linda Richter.

3.3. Sample

Samples of young men and women between the ages of 16 and 20 years, in three urban sites, Soweto (Johannesburg), Umlazi (Durban) and Khayelitsha (Cape Town) were obtained in two stages. Firstly, using available township maps as the sampling frame, 450 stands were

randomly selected in each site. Each stand was visited and the youth in the designated age category, resident on the stand, were enumerated. Subsequently 150 male and 150 female youth were randomly selected from an age-stratified list for inclusion in the site sample. On completion of the fieldwork, a total of 864 young people (415 males and 449 females) had been interviewed.

The current analysis only included those adolescents who had initiated sexual activity. Of the 864 adolescents originally interviewed, 587 (67.9%) had become sexually active. The breakdown of age and gender of the sample used in this analysis appears in table 1, below. Overall, the sub-sample of youth that had ever had sex consisted of 49.4% males and 50.6% females. The table shows that 14.3% of the sample were 16 year olds, 17.0% was 17, 25.7% were 18, 19.8% were 19 and 23.2% were 20 year olds. The largest group was 18-year-old females who made up 13.6% of the sample, followed by 20-year-old females who constituted 13.3% of the sample. Males, who were 18 years old, constituted 12.1% of the sample.

Table 1 Age and gender of sexually active adolescents

		Gender		Row total
		Male	Female	
Age	16	47 (8.0%)	37 (6.3%)	84 (14.3%)
	17	63 (10.7%)	37 (6.3%)	100 (17.0%)
	18	71 (12.1%)	80 (13.6%)	151 (25.7%)
	19	51 (8.7%)	65 (11.1%)	116 (19.8%)
	20	58 (9.9%)	78 (13.3%)	136 (23.2%)
Column total		290 (49.4%)	297 (50.6%)	587 (100.0%)

3.4. Instrument

The Youth Reproductive Health Survey questionnaire was developed for the survey. It consisted of 171 open and closed questions. There were 27 biographical questions, 12

questions on self esteem and locus of control, 11 questions on risk taking behaviour, 18 questions on gender relations, 5 questions on reproductive knowledge, 14 questions on sexual behaviour, 14 questions on pregnancy, 22 questions on STD's and HIV / AIDS, 14 questions on reproductive health services, 20 questions on condom perception and use and 14 questions on the potential of the media to influence young people.

3.5. Variables and scales used in the analysis

The original questionnaire items were used to create scales of variables that were conceptually consistent on the basis of the current literature and common sense. Scales were created to allow a number of variables measuring the same underlying factor to be entered into a statistical model at once. The validity of these scales was then examined by correlating each proposed item in a scale with the other items in the scale and with the scale total. Items that had a low correlation with other items and the scale total were removed from the scale. The Cronbach alpha of the scale was then calculated to ensure that the scale had adequate reliability. The final scales and their Cronbach alpha appear in the tables under the description of each variable. Once the raw score on each scale had been calculated, frequencies, means and medians were calculated. Categories were created from the original scales to simplify them into categorical variables that could be meaningfully interpreted in a binary logistic regression model. The formation of these categories will be described under each variable.

3.5.1. Dependent variable

Adolescents were asked 'Did you use a condom the last time you had sex?' Dependent on their response, adolescents were classified as having (1) used a condom at last sex or having (0) not used a condom.

3.5.2. Biological

The biological risk domain variables included in the analysis were age and gender. Age was entered as (1) 16 – 18 years and (2) 19 – 20 years. It was hypothesised that younger adolescents would be more likely than the older adolescents to have used a condom at last sex. Gender was entered as (1) male and (2) female. It was hypothesised that males would be more likely than females to have reported condom use last sex.

3.5.3. Proximate social context

The proximate social context variables were family structure, parental education and communication.

Family structure was based on the item 'Who were you living with when you were 14 years old?' To determine whether those adolescents from intact families were more likely to have used a condom at last sex, the responses were categorised as (1) lived with both mother and father and (2) other living arrangements.

The items 'What was the highest level of education attained by your mother?' and 'What was the highest level of education attained by your father?' were used as measures of parental education. This variable was categorised as (1) completed secondary education and (2) did not complete secondary education. It was hypothesised that those adolescents with parents who had a higher level of education would be more likely to have used a condom at last sex.

Parent-adolescent communication was based on whether or not the adolescents nominated their parents when asked 'Do you have anyone you can have discussions/ conversations with about sexual matters? If have you have someone, who is it?' As multiple responses were allowed, a dummy variable (1) yes and (2) no was created for 'Able to discuss sexual matters with a parent or parent figure.' It was hypothesised that those adolescents who were able to discuss sexual matters with a parent would be more likely to have used a condom at last sex.

3.5.4. Distal social context

The distal social context variables were related to school sex education and the promotion of condom use by health services.

3.5.4.1. Sex education

This scale consisted of seven items relating to the whether or not the adolescent had received sex education and if they had, whether topics such as pregnancy, contraception, HIV/AIDS, STDs and condom use were covered. The scores used to create this scale appear in table 2. When the scores were summed, the mean score was 2.12 and the median was 2.00. However,

categorising the variables on this basis ignored the fact that 32.7% of the adolescents had not received any sex education as shown in table 3. Adolescents who had a zero score were classified as having (1) no sex education. Those who had a score of one or two were classified as having sex education that covered (2) some topics and those with a score of three or more points were classified as having sex education that covered (3) most topics. It was hypothesised that those adolescents who had received more in-depth sex education were more likely to have used a condom at last sex.

Table 2 Sex education scale

Item	Score
Have you received formal instruction at school on reproductive health issues?	Yes =1
If received formal instruction, which of the following topics were covered?	Pregnancy =1 STDs =1 Contraception =1 HIV/AIDS =1
If seen a condom, where did you see it/ who showed it to you? School / teacher nominated.	Yes =1
If [how to use a condom so it protects you during sex] been explained, who explained it to you? School / teacher nominated.	Yes =1
Alpha = 0.7328, Mean = 2.12 Median = 2.00	

Table 3 Raw scores on the sex education scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	192	32.7	32.7	32.7
	1.00	22	3.7	3.7	36.5
	2.00	118	20.1	20.1	56.6
	3.00	109	18.6	18.6	75.1
	4.00	81	13.8	13.8	88.9
	5.00	56	9.5	9.5	98.5
	6.00	6	1.0	1.0	99.5
	7.00	3	.5	.5	100.0
	Total	587	100.0	100.0	

3.5.4.2. Health professional promoted condom use

This scale measured the extent of health services promotion of condom use. It consisted of 3 items, *viz.* being shown a condom by a health professional, having a health professional explain condom use and being given a condom by a health professional. The scores used to create this scale appear in table 4. The mean was 1.01 and the median was 1.00. However, this does not reflect the fact that 44.3% of the adolescents had a zero score as shown in table 5. Those adolescents who had received any such exposure, i.e. a score or one or more were grouped as (1) having had contact with a health professional whom promoted condom use. Those with a score of zero were classified as (2) those who had not had any such contact. It was hypothesised that adolescents who had had contact with a health professional who promoted condom use would be more likely to have used a condom at last sex.

Table 4 Health services scale

Item	Score
If seen a condom, where did you see it/ who showed it to you? Health professional nominated.	Yes =1
If [how to use a condom so it protects you during sex] been explained, who explained it to you? Health professional nominated.	Yes =1
Who gave them [condoms] to you? Health professional nominated.	Yes =1
Alpha = 0.6503, Mean = 1.01 , Median = 1.00	

Table 5 Raw scores on the health services scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	260	44.3	44.3	44.3
	1.00	141	24.0	24.0	68.3
	2.00	103	17.5	17.5	85.9
	3.00	83	14.1	14.1	100.0
	Total	587	100.0	100.0	

3.5.5. Perception of own risk environment

The perception of the risk environment in relation to the self included knowledge of sexual matters, the perception of risk and the perception of barriers.

3.5.5.1. Knowledge scale

The knowledge scale consisted of items related to knowledge about menstruation, pregnancy, HIV/AIDS and sexually transmitted diseases and the methods of pregnancy, HIV and STD prevention. Table 6 details the construction of this scale. The scores on the knowledge scales had a mean of 12.59 and a median of 12. The raw scores on the knowledge scale are depicted in table 7. Those with a score below 12 were grouped as having (1) a lower level of knowledge and those with a score above 12 were categorised as having a (2) a higher level of knowledge. It was hypothesised that those adolescents with an above average level of sexual knowledge would be more likely than those with a below average sexual knowledge to have used a condom at last sex.

Table 6 Knowledge scale

Item	Score
Had someone explained menstruation to you?	Yes =1
What do you think are the ways to protect against pregnancy?	Abstinence =1 Intracural intercourse =1 Withdrawal =1 Rhythm method =1 Contraceptives (excl. condoms) =1 Condoms =1
Do you know what an STD is?	Yes = 1
What do you think are the ways you can protect yourself from getting STDs?	Condom use = 1 Abstinence =1
Do you know what HIV is?	Yes =1
If you do know, can you tell me what you know?	HIV is sexually transmitted =1 Condoms protect against the transmission of HIV =1 HIV may be transmitted by blood =1 HIV is related to AIDS =1 There is no cure for HIV =1
Do you know what AIDS is?	Yes =1
If you do know, can you tell me what you know?	AIDS is related to HIV =1 AIDS is incurable =1 AIDS is sexually transmitted =1 Condoms protect against the transmission of the virus that causes AIDS =1 The virus that causes AIDS may be transmitted by blood =1 AIDS may manifest itself as infections =1
What do you think are the ways to protect against HIV/AIDS?	Condoms =1 Abstinence =1
Have you ever seen a condom?	Yes =1
Why do you think people use condoms?	Contraception =1 STD protection =1 AIDS protection =1
Has anyone ever explained to you how to use a condom so it protects you during sex?	Yes =1
Alpha = 0.7488, Mean = 12.59, Median = 12.00	

Table 7 Raw score on the knowledge scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	1	.2	.2	.2
	3.00	5	.9	.9	1.0
	4.00	15	2.6	2.6	3.6
	5.00	10	1.7	1.7	5.3
	6.00	14	2.4	2.4	7.7
	7.00	26	4.4	4.4	12.1
	8.00	22	3.7	3.7	15.8
	9.00	33	5.6	5.6	21.5
	10.00	55	9.4	9.4	30.8
	11.00	55	9.4	9.4	40.2
	12.00	58	9.9	9.9	50.1
	13.00	56	9.5	9.5	59.6
	14.00	53	9.0	9.0	68.7
	15.00	44	7.5	7.5	76.1
	16.00	33	5.6	5.6	81.8
	17.00	41	7.0	7.0	88.8
	18.00	17	2.9	2.9	91.7
	19.00	19	3.2	3.2	94.9
	20.00	8	1.4	1.4	96.3
	21.00	10	1.7	1.7	98.0
	22.00	3	.5	.5	98.5
	23.00	3	.5	.5	99.0
	24.00	5	.9	.9	99.8
	25.00	1	.2	.2	100.0
	Total	587	100.0	100.0	

3.5.5.2. Perception of risk

This scale consisted of items related to pregnancy, HIV, STDs as perceived risks of sex, and being concerned about these risks. These items appear in table 8. The scale had a mean of 3.33 and a median of 3. The raw scores are depicted in table 9. Those with a score below 3 were categorised as having (1) a lower perception of risk and those with a score over 4 were

categorised as having (2) a higher perception of risk. It was hypothesised that those adolescents who perceived themselves to be at greater risk of the negative consequences of sex would be more likely to have used a condom at last sex.

Table 8 Perception of risk scale

Item	Score
Are you concerned about becoming pregnant or making a girl pregnant?	Yes =1
Are you concerned that you could get an STD?	Yes =1
Are you concerned about getting HIV/AIDS?	Yes =1
What do you think are some of the risks of having sex?	Pregnancy =1 STDs =1 AIDS =1
Alpha = 0.6774, Mean = 3.33, Median = 3.00	

Table 9 Raw scores on the perception of risk scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	4	.7	.7	.7
	1.00	54	9.2	9.2	9.9
	2.00	92	15.7	15.7	25.6
	3.00	122	20.8	20.8	46.3
	4.00	119	20.3	20.3	66.6
	5.00	88	15.0	15.0	81.6
	6.00	73	12.4	12.4	94.0
	7.00	20	3.4	3.4	97.4
	8.00	8	1.4	1.4	98.8
	9.00	7	1.2	1.2	100.0
	Total	587	100.0	100.0	

3.5.5.3. Perception of barriers

There were 17 items in this scale. The items were related to the general barriers adolescents felt young people faced in pregnancy, STD and HIV prevention. Six of the items were related

to partner concerns, such as the partner's reluctance to use condoms and issues such as trust and monogamy. Table 10 indicates how this scale was constructed. The mean score was 2.51 and the median score was 2.00. Nearly a third (31.9%) of the adolescents had a zero score as indicated in table 11. Those adolescents who scored a zero on this scale were grouped as perceiving (1) no barriers. Individuals scoring between 1 and 3 were grouped as perceiving (2) some barriers and those with a score of 4 or more were categorised as perceiving (3) many barriers. It was hypothesised that those adolescents who perceived more barriers to protective behaviour would be less likely to have used a condom at last sex.

Table 10 Perception of barriers

Item	Score
Do you think young people encounter problems trying to protect themselves from HIV/AIDS?	Yes =1
If yes, are problems, what are they?	Ignorance =1 Lack of control / passion = 1 Distrust condoms/ contraceptives = 1 Interpersonal circumstances = 1 Partners negative attitudes to condoms = 1
What do you think is the best way to protect against HIV/AIDS?	Monogamy =1
Do you think young people encounter problems trying to protect themselves from getting STDS?	Yes =1
If yes, are problems, what are they?	Partner does not want to use condoms =1 Ignorance =1 Risk behaviour/ alcohol/ drugs =1 Trust issues =1 Rape =1
Do you think young people encounter problems trying to protect themselves from unplanned or unwanted pregnancies?	Yes =1
If yes, are problems, what are they?	Alcohol =1 Attitudes of health staff to youth sexuality =1 Fear of losing or displeasing partner =1
Alpha = 0.7126, Mean = 2.51 Median = 2.00	

Table 11 Raw scores on the perception of barriers scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	187	31.9	31.9	31.9
	1.00	58	9.9	9.9	41.7
	2.00	94	16.0	16.0	57.8
	3.00	51	8.7	8.7	66.4
	4.00	64	10.9	10.9	77.3
	5.00	42	7.2	7.2	84.5
	6.00	44	7.5	7.5	92.0
	7.00	31	5.3	5.3	97.3
	8.00	15	2.6	2.6	99.8
	9.00	1	.2	.2	100.0
	Total	587	100.0	100.0	

3.5.6. Perception of peer sexual behaviour

Two items were used as indicators of the perceived level of peer risky sexual behaviour. These were:

1. 'Have any of your friends had an unplanned or unwanted pregnancy / have any of your friends made a girl pregnant that was unplanned or unwanted?'
2. 'Do you know or think that any of your friends have had an STD?'

It was hypothesised that those adolescents who had peers who had suffered the negative consequences of unprotected sex were more likely to have used a condom at last sex.

The perception of peer condom use was measured by the item 'If seen a condom, where did you see it/ who showed it to you?' Those adolescents who had been shown a condom by a same sex peer were thought to be more positively influenced by peers with regard to condom use, and consequently would be more likely to have used a condom at last sex. A dummy

variable variable, 'Shown a condom by a same sex peer' was created. It classified adolescents as (1) yes, been shown a condom by a same sex peer and (2) no, not been shown a condom by a same sex peer.

3.5.7. Personality

The personal characteristics included in the analysis were goal orientation, and locus of control.

3.5.7.1. Goal orientation

This scale consisted of four items relating to educational and career goals (see table 12). The mean of the scale was 3.06 and the median was 4.00. The raw scores are shown in table 13. Those adolescents who had answered affirmatively to all the goals, i.e. who had a score of four, were classified as (2) more goal orientated and those who scored three or less were classified as (1) less goal orientated. It was hypothesised that those adolescents who were more goal-orientated would be more likely to have used a condom at last sex.

Table 12 Goal orientation scale

Item	Score
Currently at school, intending to complete secondary education	Yes =1
Intending to complete tertiary education	Yes = 1
What are your main goals and ambitions for the next few years?	Education = 1 Career = 1
Alpha = 0.6348, Mean = 3.06, Median = 4.00	

Table 13 Raw score on goal orientation scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	27	4.6	4.6	4.6
	1.00	38	6.5	6.5	11.1
	2.00	108	18.4	18.4	29.5
	3.00	115	19.6	19.6	49.1
	4.00	299	50.9	50.9	100.0
	Total	587	100.0	100.0	

3.5.7.2. Locus of control

This variable was measured by the item, 'Do you feel as if (1) your life is mainly controlled by other people or (2) mainly under your own control.' It was hypothesised that those adolescents who felt that life was mainly under their own control would be more likely to have used a condom at last sex.

3.5.8. Behaviour

The general behaviour domain contained the regularity of church attendance and engagement in risk taking activities.

3.5.8.1. Church attendance

This was measured by the number of religious services attended in the 6 months preceding the interview. Adolescents were grouped as having attended (1) none or very few services or (2) attending more regularly. It was hypothesised that those adolescents who attended more

religious services would be less likely to have used a condom at last sex.

3.5.8.2. Risk taking behaviour scale

This scale consisted of six items regarding the use of cigarettes, alcohol, dagga (marijuana) and illegal drugs, as shown in table 14. The mean was 1.04 and the median of the scale was 0.00. The raw scores on the risk behaviour scale appear in table 15. Adolescents who had a score of zero were classified as having engaged in (1) no risk taking behaviour. Those who scored one or more were classified as having engaged in (2) risk taking behaviour. It was hypothesised that those adolescents who had engaged in risk taking behaviour would be less likely than those who had not to have used a condom at last sex.

Table 14 Risk taking scale

Item	Score
Have you ever smoked cigarettes/pipe?	Never =0 Occasionally = 1 Regularly = 2
Have you ever drunk alcohol?	Never =0 Occasionally = 1 Regularly = 2
Have you ever been so drunk that you weren't sure what was going on?	Yes = 1
Have you ever had sex when you've been drunk?	Yes = 1
Have you ever tried "dagga"?	Yes =1
Have you ever tried any other (recreational) drugs?	Yes = 1
Alpha = 0.6923, Mean = 1.04, Mean = 0.00	

Table 15 Raw score on risk taking behaviour scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	323	55.0	55.2	55.2
	1.00	107	18.2	18.3	73.5
	2.00	63	10.7	10.8	84.3
	3.00	44	7.5	7.5	91.8
	4.00	21	3.6	3.6	95.4
	5.00	11	1.9	1.9	97.3
	6.00	9	1.5	1.5	98.8
	7.00	4	.7	.7	99.5
	8.00	3	.5	.5	100.0
	Total	585	99.7	100.0	
Missing	System	2	.3		
Total		587	100.0		

3.5.9. Sexual behaviour

The sexual behaviour variables related to past consequences of unprotected sex were 'Have you ever thought you were pregnant/ have you ever thought you made a girl pregnant?' and 'Have you ever had an STD?' It was hypothesised that those adolescents who had experienced these outcomes of unprotected sex would be more likely to have used a condom at last sex.

A discussion of protective behaviour with a partner variable was created on the basis of the items 'Have you ever discussed sex with a partner?' and 'If have discussed, what sorts of things did you talk about?' Those adolescents who indicated that they had talked about contraception and / or protection, had discussions about pregnancy and / or disease protection were categorised as yes; and those who had not had any such discussions were categorised as

no. It was hypothesised that those adolescents who had ever had such discussions were more likely to have used a condom at last sex.

This domain also contained a variable related to current use of reliable birth control methods such as the pill and injectables, but excluded condoms. This was based on the items 'Are you using anything to prevent pregnancy? If yes, what?' It was hypothesised that those adolescents using another form of birth control would be less likely to have used a condom at last sex.

The number of sexual partners the adolescent had in the previous six months were categorised as (1) one or less and (2) two or more partners. This was based on the item 'With how many partners have you had intercourse in the last six months?' It was hypothesised that those adolescents who had sex with more partners would be more likely to have used a condom at last sex.

3.6. Statistical analysis

The data was analysed using binary logistic regression as the dependent variable only had two values, which means that the assumption of normality of distribution of a continuous dependent variable necessary for multiple regression is violated. Discriminant analysis, while allowing for a categorical dependent variable, requires that the data strictly meet the assumptions of multivariate normality of independent variables, as well as equal variance-covariance matrices. Logistic regression does not face these strict assumptions and is much more robust when these assumptions are not met (SPSS, 1997; Hair, Anderson, Tatham &

Black, 1998). As the data did not satisfy the assumptions of normality and equal variance-covariance matrices, the binary logistic regression technique was used.

The aim of the initial univariate analysis was to examine the impact of the individual factors or variables on condom use at last sex. The variables within each risk domain were then entered into binary logistic regressions as a block to determine the impact of each domain as a separate source of impact.

The significant variables within each risk domain were entered using the Forward LR variable selection algorithm to determine the relative importance of the individual variables and their collective impact on condom use at last sex. A pseudo R^2 value, which is similar to the R^2 value in regression analysis, was used to represent overall model fit.

The Loglinear Model Selection analysis available in SPSS 9.0 was used to examine the relationships between the predictors to determine the significant interactions between the independent variables which impacted on condom use at last sex.

The significant interactions were entered into a binary logistic regression to improve the predictive power of the model. In the final binary logistic regression, all the significant predictors and their interactions were analysed using the Forward LR variable selection algorithm in order to obtain the model that best fitted the data.

The final step in the data analysis was to examine each significant interaction between the independent variables separately to determine its impact on condom use at last sex.

4. Results

4.1. Risk domain logistic regression models

The purpose of this component of the analysis was to determine the impact of each domain as a separate source of impact. The variables were entered into binary logistic regression models, using the Enter method to ensure that all the variables remained in the model for the overall impact of the risk domain to be assessed. The odds ratios depicted in the tables in this section have been adjusted by the SPSS Enter method to take interactions between the independent variables into account (SPSS, 1997).

4.1.1. Biological

Overall, the biological risk domain accounted for 5% of the outcome. Age was non-significant and gender was a significant predictor of condom use at last sex. Adolescent males were 2.3 times more likely than females to have used a condom at last sex.

Table 16 Impact of biological risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Age group				
16 - 18	*0.081*	*0.72*	*0.50*	*1.04*
19 - 20				
Gender				
Male	*0.000*	*2.27*	*1.57*	*3.27*
Female				
X^2 = 21.243, df = 2, p = 0.0000				
Nagelkerke R^2 = 0.050				

4.1.2. Proximate social context

The proximate social context risk domain accounted for only 0.5% of the outcome. None of the variables were significant predictors of condom use at last sex.

Table 17 Impact of proximate social context risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Lived with both parents				
Yes	*0.692*	*1.08*	*0.75*	*1.56*
No				
Maternal secondary education				
Completed	*0.602*	*1.13*	*0.72*	*1.75*
Did not complete				
Paternal secondary education				
Completed	*0.837*	*0.95*	*0.61*	*1.50*
Did not complete				
Able to discuss sexual matters with a parent				
Yes	*0.200*	*1.79*	*0.73*	*4.37*
No				
$X^2 = 2.143$, df = 4, p = 0.7095				
Nagelkerke $R^2 = 0.005$				

4.1.3. Distal social context

The distal social context risk domain accounted for 5% of the outcome. School sex education was not a significant predictor of condom use at last sex. Adolescents who had had contact with a health professional who promoted condom use were 2.3 times more likely to have used a condom at last sex than those who had not had such contact.

Table 18 Impact of distal social context risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Health professional promoted				
Yes	*0.000*	*2.33*	*1.57*	*3.46*
No				
School sex education	0.630			
None	*0.742*	*1.08*	*0.69*	*1.68*
Some topics	*0.337*	*1.24*	*0.80*	*1.95*
Most topics				
X^2 = 21.223, df = 3, p = 0.0001				
Nagelkerke R^2 = 0.050				

4.1.4. Perceived environment - self

The perceived environment in relation to the self accounted for 15.8% of the outcome. Within this model, knowledge was not a significant predictor of condom use at last sex. Adolescents who perceived themselves to be at lower risk were 0.2 times less likely to have used a condom at last sex than those who perceived a higher risk. Adolescents who perceived no barriers to protective behaviour were 1.7 times more likely to have used a condom at last sex than those who perceived many barriers. Those who perceived some barriers were almost as likely as those who perceived many barriers to have used a condom at last sex.

Table 19 Impact of perceived environment (self) risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Knowledge				
Below average	*0.769*	*0.94*	*0.63*	*1.41*
Above average				
Perception of risk				
Low	*0.000*	*0.23*	*0.15*	*0.35*
High				
Perception of barriers	0.005			
None	*0.033*	*1.66*	*1.04*	*2.63*
Some	*0.272*	*0.76*	*0.47*	*1.24*
Many				
X^2 = 69.447, df = 4, p = 0.0000				
Nagelkerke R^2 = 0.158				

4.1.5. Perceived environment - peers

The perceived environment in relation to friends' behaviour accounted for 1.5% of the outcome. None of the predictors were significant, although the variable 'same sex friend showed a condom', approached significance. Adolescents who had been shown a condom by a same sex friend were 1.5 times more likely to have used a condom at last sex.

Table 20 Impact of perceived environment (peers) risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Friends' pregnancy				
Yes	*0.688*	*0.93*	*0.65*	*1.33*
No				
Friends' STD history				
Yes	*0.113*	*1.34*	*0.93*	*1.91*
No				
Friend showed a condom				
Yes	*0.061*	*1.48*	*0.98*	*2.24*
No				
$X^2 = 6.273$, df = 3, p = 0.0991				
Nagelkerke $R^2 = 0.015$				

4.1.6. Personality

The personality risk domain accounted for 3.5% of the outcome. The locus of control was the only significant predictor of condom use at last sex. Adolescents who believed their lives were controlled by others were 0.5 times less likely than those who believed life was under their control to have used a condom at last sex.

Table 21 Impact of personality risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Locus of control				
External	*0.001*	*0.45*	*0.29*	*0.71*
Internal				
Goal orientation				
Less goal orientated	*0.752*	*1.06*	*0.74*	*1.16*
More goal orientated				
Self description				
Negative	*0.865*	*0.96*	*0.60*	*1.53*
Positive				
Fatalism				
More pessimistic	*0.289*	*0.82*	*0.57*	*1.18*
More optimistic				
$X^2 = 14.481$, df = 4, p = 0.0059				
Nagelkerke $R^2 = 0.035$				

4.1.7. Behaviour – general

The general behaviour domain accounted for 3.4% of the outcome. Church attendance was not a significant predictor of condom use. Adolescents who had engaged in no risk taking activities were 0.5 times less likely than those who had engaged in risk taking behaviours to have used a condom at last sex.

Table 22 Impact of general behaviour risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Church attendance				
Not at all/ hardly ever	*0.385*	*0.85*	*0.59*	*1.22*
More regularly				
Risk taking behaviour				
No risk taking	*0.000*	*0.50*	*0.35*	*0.73*
Risk taking				
$X^2 = 14.010$, df = 2, p = 0.0009				
Nagelkerke $R^2 = 0.034$				

4.1.8. Sexual behaviour risk domain

The sexual behaviour risk domain accounted for 7% of the outcome. Previous pregnancies and number of partners were not significant predictors of condom use. Previous STIs approached significance. Adolescents who had had an STI were 1.7 times more likely to have used a condom at last sex. Those who had discussed protection with partners were twice as likely as those who had not to have used a condom at last sex. Adolescents who were using other modern methods of birth control were half as likely to have used a condom.

Table 23 Impact of sexual behaviour risk domain on condom use: odds ratios from logistic regression

Variable	Sig.	OR	LCL	UCL
Ever pregnant				
Yes	*0.706*	*0.92*	*0.61*	*1.40*
No				
Ever had an STD				
Yes	*0.060*	*1.66*	*0.98*	*2.82*
No				
Discussed protection				
Yes	*0.000*	*2.05*	*1.42*	*2.96*
No				
Using a contraceptive				
Yes	*0.004*	*0.53*	*0.34*	*0.82*
No				
Number of partners				
One	*0.480*	*0.86*	*0.57*	*1.30*
Two or more				
$X^2 = 29.801$, df = 5, p = 0.0000				
Nagelkerke $R^2 = 0.070$				

4.1.9. Summary

The biological, the distal social context, the perceived environment in relation to the self, personality, general behaviour and sexual behaviour were the domains which significantly predicted condom use. Overall, the biological domain accounted for 5% of the outcome in condom use. The significant predictor in this domain was gender. The distal social context also accounted for 5% of the outcome, with promotion of condom use by a health professional as the significant predictor in this domain. The perceived environment in relation to the self accounted for 15.8% of the outcome. The perception of risk and the perception of barriers were the significant predictors. The personality domain accounted for 3.5% of the outcome. The locus of control emerged as the only significant predictor. The general behaviour domain accounted for 3.4% of the outcome. Risk taking was the significant predictor. The sexual behaviour domain accounted for 7.0% of the outcome. Discussion of protection with a partner and the use of other non-barrier contraceptive methods were significant predictors.

Table 24 Risk domain analysis: R2 and significant predictors

Risk domain	Nagelkerke R^2	Significant predictors
Biological	0.050*	Gender
Proximate social context	0.005	
Distal social context	0.050*	Health professional promoted condom use
Perceived environment (self)	0.158	Perception of risks, perception of barriers
Pereceived environment (peers)	0.015*	
Personality	0.035*	Locus of control
General behaviour	0.034*	Risk taking
Sexual behaviour	0.070*	Discussed protection with a partner, non-barrier contraceptive use
* $p \leq 0.05$		

4.2. Model 1

The significant predictors from each of the risk domains were entered into a binary logistic regression model using the Forward LR selection. To begin with, the model contained only the constant. At each step the variable with the smallest significance level for the score statistic is entered into the model. This means that the most significant variable enters first, followed by the second most important predictor and so on until there are no more variables with a significance level less than 0.05 (SPSS, 1997).

As shown in Table 25, the perception of risk was the most important predictor of condom use at last sex. It was followed by: gender; contact with a health professional who promoted condom use; locus of control; partner discussions; the perception of barriers; contraceptive use; and risk taking.

Table 25 Forward LR variable selection steps

Step	Variable	R^2	Step X^2	Step df	Step sign.	Change in R^2	Model X^2	Model df	Model sign
1	Perception of risk	0.134	57.899	1	0.0000	0.134	57.899	1	0.0000
2	Gender	0.173	18.151	1	0.0000	0.039	76.050	2	0.0000
3	Health services	0.209	17.026	1	0.0000	0.036	93.076	3	0.0000
4	Locus of control	0.231	10.971	1	0.0009	0.022	104.047	4	0.0000
5	Discussion with partner	0.242	5.151	1	0.0232	0.011	109.197	5	0.0000
6	Perception of barriers	0.258	8.248	2	0.0162	0.016	117.445	7	0.0000
7	Using contraception	0.267	4.778	1	0.0288	0.009	122.224	8	0.0000
8	Risk taking	0.276	4.244	1	0.0394	0.009	126.467	9	0.0000

Overall this model accounted for 27.2% of the outcome. It did not, however, take any interaction between the significant predictor variables into account.

4.3. Predictor variable interactions

The SPSS Loglinear Model Selection technique was used to determine when the interaction between two independent variables significantly impacted on the dependent variable. The dependent criterion variable and two of the significant independent predictor variables were systematically entered into this analysis until all the possible combinations were exhausted. The backward elimination variable selection algorithm was used. One of the strategies employed by this technique is to systematically test the contribution made to a model by terms of a particular order. This meant that the significance of the third-order interaction between the two independent variables and the dependent variable could be tested. In a saturated model, as in this analysis, a model including the third-order interaction, the value of the chi-square statistic is always zero. Eliminating the third-order interaction results in a change in the likelihood-ratio chi-square, which is attributable to the third-order interaction effects. If the observed significance level for the change in the likelihood-ratio chi-square is small, the hypothesis that the third-order interaction is zero is rejected, since this indicates that the model without the third-order interaction does not fit well (SPSS, 1997). Table 26 shows the test of the hypothesis that the third-order effects are zero for all possible combinations of the independent variables and the dependent variable. The significant third-order interactions were:

- Condom use * Perception of risk * Using contraception
- Condom use * Health * Using contraception
- Condom use * Health * Risk taking
- Condom use * Locus * Using contraception
- Condom use * Discussion with partner * Using contraception

Table 26 Test that third-order effects are zero

Model	DF	L.R. Chisq	Prob	Sign
*Condom use * Perception of * risk * Gender*	*1*	*3.827*	*0.0504*	*
Condom use * Perception of risk * Health	1	0.002	0.9673	ns
Condom use * Perception of risk * Locus of control	1	0.851	0.3562	ns
Condom use * Perception of risk * Discussion with partner	1	0.218	0.6409	ns
Condom use * Perception of risk * Perception of barriers	2	2.134	0.3440	ns
Condom use * Perception of risk * Using contraception	**1**	**3.870**	**0.0491**	**
Condom use * Perception of risk * Risk taking	1	0.671	0.4128	ns
Condom use * Gender * Health	1	2.465	0.1164	ns
Condom use * Gender * Locus of control	1	0.483	0.4869	ns
*Condom use * Gender * Discussion with partner*	*1*	*3.827*	*0.0504*	*
Condom use * Gender * Perception of barriers	2	4.016	0.1342	ns
Condom use * Gender * Using contraception	1	0.566	0.4519	ns
*Condom use * Gender * Risk taking*	*1*	*3.000*	*0.0833*	*
Condom use * Health * Locus of control	1	2.564	0.1094	ns
Condom use * Health * Discussion with partner	1	0.003	0.9582	ns
Condom use * Health * Perception of barriers	2	1.743	0.4183	ns
Condom use * Health * Using contraception	**1**	**6.938**	**0.0084**	***
Condom use * Health * Risk taking	**1**	**4.139**	**0.0419**	**
Condom use * Locus * Discussion with partner	1	0.017	0.8953	ns
Condom use * Locus * Perception of barriers	2	2.157	0.3402	ns
Condom use * Locus * Using contraception	**1**	**4.107**	**0.0427**	**
Condom use * Locus * Risk taking	1	0.437	0.5084	ns
Condom use * Discussion with partner * Perception of barriers	2	0.252	0.8816	ns
Condom use * Discussion with partner * Using contraception	**1**	**4.384**	**0.0363**	**
Condom use * Discussion with partner * Risk taking	1	0.007	0.9345	ns
Condom use * Perception of barriers * Using contraception	2	0.720	0.6977	ns
Condom use * Perception of barriers * Risk taking	2	1.867	0.3931	ns
Condom use * Using contraceptives * Risk taking	1	0.000	0.9899	ns
*** p <0.01 ** p<0.05 * p<0.10 ns p not signficant				

4.4. Model 2

The significant predictors and the significant three-way interactions were entered into a binary logistic regression using the Enter algorithm. This technique ensures that all the variables remain in the model. Overall, 30.3% of the variance was explained by this extended model ($X^2 = 140.509$, df = 14, p = 0.000). As the table 27 illustrates, perception of risk, health professional promotion of condom use, locus of control, discussion with partner, perception of barriers, using contraceptives and risk taking were significant predictors.

Table 27 Model 2: Impact of significant predictors and interactions on condom use - odds ratios from logistic regression

Variable	Sig	OR	LCL	UCL
Perception of risk	**.0000**	.1802	.1064	.3054
Gender	.1192	1.4902	.9022	2.4613
Health services	**.0007**	4.2229	1.8439	9.6713
Locus of control	**.0023**	.3165	.1512	.6625
Discussion with partner	**.0353**	1.7888	1.0409	3.0741
Perception of barriers	**.0182**			
None	*.0509*	*1.6832*	*.9980*	*2.8387*
Some	*.4630*	*.8216*	*.4862*	*1.3884*
Using contraception	**.0030**	.2028	.0708	.5811
Risk taking	**.0159**	.5881	.3820	.9056
Perception of risk (1) by using contraceptives (1)	.1242	.4457	.1591	1.2488
Health (1) by using contraceptives (1)	.0667	4.6961	.8988	24.5376
Health (1) by risk taking (1)	.0688	2.2019	.9411	5.1516
Locus (1) by using contraceptives (1)	.1093	.3026	.0700	1.3072
Discussion with partner (1) by using contraceptives	.5342	1.4050	.4808	4.1054

4.5. Final model

The significant predictors and the interactions between them were analysed using the Forward LR selection algorithm to obtain the best model of the data. Overall, 28.1% of the variance was explained ($X^2 = 129.332$, df = 9, p = 0.0000). The significant predictors in the model were the perception of risk, the promotion of condom use by a health professional, locus of control, discussion with a partner, the perception of barriers, the use of contraceptives, and risk taking behaviour. Gender entered the model at the second step and was removed at the ninth step. The interaction between a health professional promoting condom use and the use of other forms of birth control was significant.

Table 28 Final model: Forward LR selection steps

Step	Variable	R^2	Step X^2	Step df	Step sign.	Change in R^2	Model X^2	Model df	Model sign
1	Perception of risk	0.134	57.899	1	0.0000	0.134	57.899	1	0.0000
2	Gender	0.173	18.151	1	0.0000	0.039	76.050	2	0.0000
3	Health services	0.209	17.026	1	0.0000	0.036	93.076	3	0.0000
4	Locus of control	0.231	10.971	1	0.0009	0.022	104.047	4	0.0000
5	Discussion with partner	0.242	5.151	1	0.0232	0.011	109.197	5	0.0000
6	Perception of barriers	0.258	8.248	2	0.0162	0.016	117.445	7	0.0000
7	Using contraception	0.267	4.778	1	0.0288	0.009	122.224	8	0.0000
8	Risk taking	0.276	4.244	1	0.0394	0.009	126.467	9	0.0000
9	Remove gender	0.272	-1.935	1	0.1642	-0.004	124.532	8	0.0000
10	Health services (1) * Using contraceptives (1)	0.281	4.800	1	0.0285	0.009	129.332	9	0.0000

Table 29 Final model: Impact of significant predictors and interactions on condom use - odds ratios from logistic regression

Variables remaining in the model	Sig	OR	LCL	UCL
Perception of risk	0.0000	0.2152	0.1408	0.3290
Health services	0.0005	4.0358	1.8301	8.8997
Locus of control	0.0023	0.4526	0.2719	0.7532
Discussion with partner	0.0135	1.6859	1.1139	2.5515
Perception of barriers	0.0080			
None	*0.0218*	*1.8174*	*1.0908*	*3.0281*
Some	*0.5366*	*0.8496*	*0.5066*	*1.4248*
Using contraception	0.0012	0.2682	0.1211	0.5944
Risk taking	0.0184	0.6119	0.4068	0.9205
Health services by Using contraception	0.0565	4.6287	0.9584	22.3544

4.6. Controlled Analysis

In this section, the significant third-order and second-order interactions among the independent predictor variables and the dependent criterion variable were examined more carefully. The purpose of this analysis was to highlight the influence of risk domains on each other. The significant interactions among the independent variables appear in bold in table 30. The complete analysis appears in Appendix A.

Table 30 Significant interactions between independent variables

Variables entered into the model	Significant interactions
Condom use, Perception of risk, Gender,	CU*PR, CU*G
Condom use, Perception of risk, Health	CU*PR, CU*H
Condom use, Perception of risk, Locus of control	CU*PR, CU*LC
Condom use, Perception of risk, Discussion with partner	CU*PR, CU*DP, **PR*DP**
Condom use, Perception of risk, Perception of barriers	CU*PR, CU*PB, **PR*PB**
Condom use, Perception of risk, Using contraception	**CU*PR*UC**
Condom use, Perception of risk, Risk taking	CU*PR, CU*RT
Condom use, Gender, Health	CU*G, CU*H
Condom use, Gender, Locus of control	CU*G, CU*LC, **G*LC**
Condom use, Gender, Discussion with partner	CU*G, CU*DP
Condom use, Gender, Perception of barriers	CU*G, CU*PB, **G*PB**
Condom use, Gender, Using contraception	CU*G, **G*UC**
Condom use, Gender, Risk taking	CU*G, CU*RT, **G*RT**
Condom use, Health, Locus of control	CU*H, CU*LC
Condom use, Health, Discussion with partner	CU*H, CU*DP, **H*DP**
Condom use, Health, Perception of barriers	CU*H, CU*PB, **H*PB**
Condom use, Health, Using contraception	**CU*H*UC**
Condom use, Health, Risk taking	**CU*H*RT**
Condom use, Locus, Discussion with partner	CU*LC, CU*DP
Condom use, Locus, Perception of barriers	CU*LC, CU*PB
Condom use, Locus, Using contraception	**CU*LC*UC**
Condom use, Locus, Risk taking	CU*LC, CU*RT, **LC*RT**
Condom use, Discussion with partner, Perception of barriers	CU*DP, CU*PB, **DP*PB**
Condom use, Discussion with partner, Using contraception	**CU*DP*UC**
Condom use, Discussion with partner, Risk taking	CU*DP, CU*RT, **DP*RT**
Condom use, Perception of barriers, Using contraception	CU*PB, CU*UC, **PB*UC**
Condom use, Perception of barriers, Risk taking	CU*PB, CU*RT, **PB*RT**
Condom use, Using contraceptives, Risk taking	CU*UC, CU*RT, **UC*RT**

4.6.1. Perception of risk

Significant interactions between the perception of risk and discussion with partners, perception of barriers and the use of other birth control methods were found. As the most important predictor of condom use, the analysis aimed to establish whether a higher perception of risk was associated with condom use at last sex, when other independent variables had been controlled.

4.6.1.1. Discussion with partner

When partner discussions were controlled, a higher perception of risk was significantly and positively associated with condom use at last sex. Among those adolescents who had not discussed protection with a partner, those who perceived a higher risk were 2.9 times more likely than those who perceived a lower risk to have used a condom at last sex. Those adolescents who had discussed protection with a partner and who perceived a higher risk were 2.2 times more likely to have used a condom.

Table 31 Perception of risk and discussion with partner

Discussion with partner			Used a condom at last sex				Total	
			No		Yes			
			N	%	N	%	N	%
Yes	Perception of risk	Lower	114	74.0%	40	26.0%	154	100.0%
		Higher	46	43.8%	59	56.2%	105	100.0%
	Total		160	61.8%	99	38.2%	259	100.0%
No	Perception of risk	Lower	201	84.8%	36	15.2%	237	100.0%
		Higher	51	56.0%	40	44.0%	91	100.0%
	Total		252	76.8%	76	23.2%	328	100.0%

Discussion with partner	X^2	df	Sig.	OR	LCL	UCL
Yes	24.140	1	0.000	2.163	1.578	2.966
No	30.564	1	0.000	2.894	1.979	4.231

4.6.1.2. Perception of barriers

When the perception of barriers was controlled a higher perception of risk was significantly and positively associated with condom use at last sex. Those who perceived no barriers and who perceived themselves at higher risk were 2.2 times more likely than those who perceived a lower risk to have used a condom. Within those who perceived some barriers, adolescents

who perceived a higher risk were 4.0 times more to have used a condom. Among those adolescents who perceived many barriers to protective behaviour, those who perceived themselves at higher risk were 2.3 times more likely to have used a condom at last sex than those who perceived themselves to be at lower risk.

Table 32 Perception of risk and perception of barriers

Perceived barriers			Used a condom at last sex				Total	
			No		Yes			
			N	%	N	%	N	%
None	Perception of risk	Lower	100	73.0%	37	27.0%	137	100.0%
		Higher	20	40.0%	30	60.0%	50	100.0%
	Total		120	64.2%	67	35.8%	187	100.0%
Some	Perception of risk	Lower	137	87.8%	19	12.2%	156	100.0%
		Higher	24	51.1%	23	48.9%	47	100.0%
	Total		161	79.3%	42	20.7%	203	100.0%
Many	Perception of risk	Lower	78	79.6%	20	20.4%	98	100.0%
		Higher	53	53.5%	46	46.5%	99	100.0%
	Total		131	66.5%	66	33.5%	197	100.0%

Perceived barriers	X^2	df	Sig.	OR	LCL	UCL
None	17.343	1	0.000	2.222	1.556	3.173
Some	29.738	1	0.000	4.018	2.406	6.709
Many	15.009	1	0.000	2.277	1.460	3.551

4.6.1.3. Using contraceptives

When the use of methods of birth control other than the condom was controlled for, a higher perception of risk was significantly and positively associated with condom use at last sex. Adolescents who were not using another method of birth control and who perceived a higher risk were 2.2 times more likely to have used a condom at last sex. Adolescents using other methods of birth control and who perceived themselves to be at higher risk were 5.2 times more likely than those who perceived themselves to be at lower risk to have used a condom at

last sex.

Table 33 Perception of risk and contraceptive use

Using birth control			Used a condom at last sex				Total	
			No		Yes			
			N	%	N	%	N	%
Yes	Perception of risk	Lower	104	91.2%	10	8.8%	114	100.0%
		Higher	33	54.1%	28	45.9%	61	100.0%
	Total		137	78.3%	38	21.7%	175	100.0%
No	Perception of risk	Lower	211	76.2%	66	23.8%	277	100.0%
		Higher	64	47.4%	71	52.6%	135	100.0%
	Total		275	66.7%	137	33.3%	412	100.0%

Using birth control	X^2	df	Sig.	OR	LCL	UCL
Yes	32.226	1	0.000	5.233	2.727	10.040
No	33.839	1	0.000	2.207	1.694	2.876

4.6.2. Gender

Significant interactions between gender and locus of control, perception of barriers, the use of other birth control methods and risk taking were found.

4.6.2.1. Locus of control

Among male respondents there was no significant difference between those with an external and those with an internal locus of control in condom use at last sex. Female adolescents who felt that their life was under their own control were twice as likely to have used a condom at last sex as those who felt life was under the control of others.

Table 34 Gender and locus of control

Gender			Used a condom at last sex				Total	
			No		Yes			
			N	%	N	%	N	%
Male	Locus of control	External	38	71.7%	15	28.3%	53	100.0%
		Internal	142	59.9%	95	40.1%	237	100.0%
	Total		180	62.1%	110	37.9%	290	100.0%
Female	Locus of control	External	86	86.9%	13	13.1%	99	100.0%
		Internal	146	73.7%	52	26.3%	198	100.0%
	Total		232	78.1%	65	21.9%	297	100.0%

Gender	X^2	df	Sig.	OR	LCL	UCL
Male	2.554	1	0.110	1.416	0.898	2.234
Female	6.657	1	0.010	2.000	1.145	3.494

4.6.2.2. Perception of barriers

Among males, the perception of barriers did not significantly impact on condom use at last sex. Females who perceived no barriers were as likely as those who perceived many barriers to have used a condom at last sex. Females who perceived some barriers were 0.28 times less likely than those who perceived many barriers to have used a condom at last sex.

Table 35 Gender and perception of barriers

Gender			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Male	Perceived barriers	None	70	58.3%	50	41.7%	120	100.0%
		Some	63	67.7%	30	32.3%	93	100.0%
		Many	47	61.0%	30	39.0%	77	100.0%
	Total		180	62.1%	110	37.9%	290	100.0%
Female	Perceived barriers	None	50	74.6%	17	25.4%	67	100.0%
		Some	98	89.1%	12	10.9%	110	100.0%
		Many	84	70.0%	36	30.0%	120	100.0%
	Total		232	78.1%	65	21.9%	297	100.0%

Gender		X^2	df	Sig.	OR	LCL	UCL
Male	Barriers	2.037	2	0.3667			
	None			*0.7060*	*1.1190*	*0.6238*	*2.0074*
	Some			*0.3635*	*0.7462*	*0.3968*	*1.4031*
Female	Barriers	13.801	2	0.0025			
	None			*0.5013*	*0.7933*	*0.4040*	*1.5577*
	Some			*0.0006*	*0.2857*	*0.1397*	*0.5843*

4.6.2.3. Contraceptive use

When gender was controlled, there was no significant difference in condom use between those using other forms of birth control and those who were not.

Table 36 Gender and contraceptive use

Gender			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Male	Using contraceptives	Yes	8	57.1%	6	42.9%	14	100.0%
		No	172	62.3%	104	37.7%	276	100.0%
	Total		180	62.1%	110	37.9%	290	100.0%
Female	Using contraceptives	Yes	129	80.1%	32	19.9%	161	100.0%
		No	103	75.7%	33	24.3%	136	100.0%
	Total		232	78.1%	65	21.9%	297	100.0%

Gender	X^2	df	Sig.	OR	LCL	UCL
Male	0.152	1	0.697	1.137	0.610	2.122
Female	0.831	1	0.362	0.819	0.533	1.258

4.6.2.4. Risk taking

Among males, there was no significant difference between those who had not engaged in any risk taking behaviour and those who had engaged in risky behaviours, in condom use at last sex. Females who had engaged in risk taking activities were, however, 1.9 times more likely to have used a condom at last sex than those who had not engaged in risky activities

Table 37 Gender and risk taking

			Used a condom at last sex				Total	
			No		Yes			
Gender			N	%	N	%	N	%
Male	Risk taking	No risk taking	79	64.8%	43	35.2%	122	100.0%
		Risk taking	100	59.9%	67	40.1%	167	100.0%
	Total		179	61.9%	110	38.1%	289	100.0%
Female	Risk taking	No risk taking	167	83.1%	34	16.9%	201	100.0%
		Risk taking	64	67.4%	31	32.6%	95	100.0%
	Total		231	78.0%	65	22.0%	296	100.0%

Gender	X^2	df	Sig.	OR	LCL	UCL
Male	0.710	1	0.399	1.138	0.840	1.542
Female	9.298	1	0.002	1.929	1.266	2.939

4.6.3. Health services

Significant interactions between contact with a health professional who promoted condom use and discussion with partners, perception of barriers, the use of other birth control methods and risk taking were found.

4.6.3.1. Discussion with a partner

When discussion with a partner about protection was controlled, contact with a health professional who promoted condom use was significantly and positively associated with condom use at last sex. In the absence of previous discussions regarding protection with a partner, those adolescents who had been in contact with health professionals who encouraged condom use were 1.8 times more likely to have used a condom.

Table 38 Health promotion and discussion with a partner

Discussion with partner			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Yes	Health promotion	Yes	96	56.1%	75	43.9%	171	100.0%
		No	64	72.7%	24	27.3%	88	100.0%
	Total		160	61.8%	99	38.2%	259	100.0%
No	Health promotion	Yes	109	69.9%	47	30.1%	156	100.0%
		No	143	83.1%	29	16.9%	172	100.0%
	Total		252	76.8%	76	23.2%	328	100.0%

Discussion with partner	X^2	df	Sig.	OR	LCL	UCL
Yes	6.769	1	0.009	1.608	1.099	2.354
No	8.089	1	0.004	1.787	1.187	2.690

4.6.3.2. Perception of barriers

Among those adolescents who perceived many barriers to protective behaviour those who had been in contact with a health professional who promoted condom use were 1.9 times more likely than those who had not had such contact, to have used a condom at last sex.

Table 39 Health promotion and perception of barriers

Perceived barriers			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
None	Health promotion	Yes	47	51.6%	44	48.4%	91	100.0%
		No	73	76.0%	23	24.0%	96	100.0%
	Total		120	64.2%	67	35.8%	187	100.0%
Some	Health promotion	Yes	77	75.5%	25	24.5%	102	100.0%
		No	84	83.2%	17	16.8%	101	100.0%
	Total		161	79.3%	42	20.7%	203	100.0%
Many	Health promotion	Yes	81	60.4%	53	39.6%	134	100.0%
		No	50	79.4%	13	20.6%	63	100.0%
	Total		131	66.5%	66	33.5%	197	100.0%

Perceived barriers	X^2	df	Sig.	OR	LCL	UCL
None	12.090	1	0.001	2.018	1.333	3.056
Some	1.823	1	0.177	1.456	0.839	2.527
Many	6.884	1	0.009	1.917	1.131	3.249

4.6.3.3. Using contraceptives

When the use of methods of birth control other than the condom was controlled for, contact with a health professional who promoted condom use was significantly and positively associated with condom use at last sex. Those adolescents who were using other birth control methods were 8.5 times more likely to have used a condom at last sex if they had had contact with a health professional who promoted condom use. Those adolescents who were not using other contraceptive methods were 1.6 times more likely to have used a condom if they had had contact with a health professional who promoted the use of condoms.

Table 40 Health promotion and using contraceptives

Using contraceptives			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Yes	Health promotion	Yes	83	69.7%	36	30.3%	119	100.0%
		No	54	96.4%	2	3.6%	56	100.0%
	Total		137	78.3%	38	21.7%	175	100.0%
No	Health promotion	Yes	122	58.7%	86	41.3%	208	100.0%
		No	153	75.0%	51	25.0%	204	100.0%
	Total		275	66.7%	137	33.3%	412	100.0%

Using contraceptives	X^2	df	Sig.	OR	LCL	UCL
Yes	15.946	1	0.000	8.471	2.114	33.940
No	12.398	1	0.000	1.654	1.241	2.205

4.6.3.4. Risk taking

Non risk takers who had been in contact with a health professional who had promoted condom use were significantly more likely (2.6 times more likely) to have used a condom at last sex. Among risk takers, contact with a health professional who promoted condom use was not significantly associated with an increased likelihood of condom use at last sex.

Table 41 Health promotion and risk taking

Risk taking			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
No risk taking	Health promotion	Yes	112	66.3%	57	33.7%	169	100.0%
		No	134	87.0%	20	13.0%	154	100.0%
	Total		246	76.2%	77	23.8%	323	100.0%
Risk taking	Health promotion	Yes	92	58.6%	65	41.4%	157	100.0%
		No	72	68.6%	33	31.4%	105	100.0%
	Total		164	62.6%	98	37.4%	262	100.0%

Risk taking	X^2	df	Sig.	OR	LCL	UCL
No risk taking	19.091	1	0.000	2.597	1.639	4.115
Risk taking	2.673	1	0.102	1.317	0.939	1.848

4.6.4. Locus of control

Significant interactions between locus of control and the use of other birth control methods and risk taking were found.

4.6.4.1. Using contraception

When the use of methods of birth control other than the condom was controlled for, an internal locus of control was significantly and positively associated with condom use at last sex. Among those adolescents using contraceptives, those with an internal locus of control were 4.7 times more likely to have used a condom at last sex.

Table 42 Locus of control and using contraceptives

Using birth control			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Yes	Locus of control	External	47	94.0%	3	6.0%	50	100.0%
		Internal	90	72.0%	35	28.0%	125	100.0%
	Total		137	78.3%	38	21.7%	175	100.0%
No	Locus of control	External	77	75.5%	25	24.5%	102	100.0%
		Internal	198	63.9%	112	36.1%	310	100.0%
	Total		275	66.7%	137	33.3%	412	100.0%

Using contraceptives	X^2	df	Sig.	OR	LCL	UCL
Yes	10.169	1	0.001	4.667	1.504	14.483
No	4.668	1	0.031	1.474	1.017	2.137

4.6.4.2. Risk taking

Those adolescents who did not engage in risk taking behaviour and who had an internal locus of control were twice as likely as those with an external locus of control to have used a condom at last sex. Among the risk takers, there was no significant difference in condom use between those with an external and those with an internal locus of control.

Table 43 Locus of control and risk taking

			Used a condom at last sex				Total	
			No		Yes			
Risk taking			N	%	N	%	N	%
No risk taking	Locus of control	External	89	85.6%	15	14.4%	104	100.0%
		Internal	157	71.7%	62	28.3%	219	100.0%
	Total		246	76.2%	77	23.8%	323	100.0%
Risk taking	Locus of control	External	34	72.3%	13	27.7%	47	100.0%
		Internal	130	60.5%	85	39.5%	215	100.0%
	Total		164	62.6%	98	37.4%	262	100.0%

Risk taking	X^2	df	Sig.	OR	LCL	UCL
No risk taking	7.490	1	0.006	1.963	1.175	3.280
Risk taking	2.323	1	0.127	1.429	0.875	2.225

4.6.5. Discussion with a partner

There were significant interactions between discussion of protection with a partner and the perception of barriers, the use of other birth control methods, and risk taking.

4.6.5.1. Perception of barriers

It was found, consistently across the perception of barriers, that those adolescents who had

discussed protection with a partner were approximately 1.6 times more likely to have used a condom at last sex.

Table 44 Discussion with partner and perception of barriers

Perceived barriers			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
None	Discussion with partner	Yes	34	51.5%	32	48.5%	66	100.0%
		No	86	71.1%	35	28.9%	121	100.0%
	Total		120	64.2%	67	35.8%	187	100.0%
Some	Discussion with partner	Yes	57	73.1%	21	26.9%	78	100.0%
		No	104	83.2%	21	16.8%	125	100.0%
	Total		161	79.3%	42	20.7%	203	100.0%
Many	Discussion with partner	Yes	69	60.0%	46	40.0%	115	100.0%
		No	62	75.6%	20	24.4%	82	100.0%
	Total		131	66.5%	66	33.5%	197	100.0%

Perceived barriers	X^2	df	Sig.	OR	LCL	UCL
None	7.106	1	0.008	1.676	1.153	2.436
Some	3.000	1	0.083	1.603	0.939	2.735
Many	5.235	1	0.022	1.640	1.054	2.551

4.6.5.2. Using contraception

When the use of methods of birth control other than condoms was controlled, discussion with a partner was significantly and positively associated with condom use at last sex. Adolescents who used other birth control methods were 3.3 times more likely to have used a condom at last sex if they had discussed protection with a partner.

Table 45 Discussion with a partner and contraceptive use

Using birth control			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Yes	Discussion with partner	Yes	57	66.3%	29	33.7%	86	100.0%
		No	80	89.9%	9	10.1%	89	100.0%
	Total		137	78.3%	38	21.7%	175	100.0%
No	Discussion with partner	Yes	103	59.5%	70	40.5%	173	100.0%
		No	172	72.0%	67	28.0%	239	100.0%
	Total		275	66.7%	137	33.3%	412	100.0%

Using contraceptives	X^2	df	Sig.	OR	LCL	UCL
Yes	14.340	1	0.000	3.335	1.678	6.626
No	6.985	1	0.006	1.443	1.100	1.894

4.6.5.3. Risk taking

When risk taking was controlled, those who had discussed protection with a partner were significantly more likely to have used a condom at last sex. Non-risk takers who had discussed protection with a partner were 1.6 times more likely to have used a condom than those who had not discussed the issue with a partner. Risk takers were 1.5 times more likely to have used a condom at last sex if they had discussed protection with a partner.

Table 46 Discussion with a partner and risk taking

Risk taking			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
No risk taking	Discussion with partner	Yes	86	68.8%	39	31.2%	125	100.0%
		No	160	80.8%	38	19.2%	198	100.0%
	Total		246	76.2%	77	23.8%	323	100.0%
Risk taking	Discussion with partner	Yes	73	54.9%	60	45.1%	133	100.0%
		No	91	70.5%	38	29.5%	129	100.0%
	Total		164	62.6%	98	37.4%	262	100.0%

Risk taking	X^2	df	Sig.	OR	LCL	UCL
No risk taking	6.086	1	0.014	1.626	1.104	2.393
Risk taking	6.855	1	0.009	1.531	1.105	2.122

4.6.6. Perception of barriers

Significant interactions between perception of barriers and the use of other birth control methods and risk taking were found.

4.6.6.1. Using contraception

The effect of using contraceptives on condom use at last sex was only significant among those adolescents who perceived some barriers to protection. Those who used other birth control methods were 0.5 times less likely than those who had not used them to have used a condom.

Table 47 Perception of barriers and contraceptive use

Perceived barriers			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
None	Using birth control	Yes	29	74.4%	10	25.6%	39	100.0%
		No	91	61.5%	57	38.5%	148	100.0%
	Total		120	64.2%	67	35.8%	187	100.0%
Some	Using birth control	Yes	53	88.3%	7	11.7%	60	100.0%
		No	108	75.5%	35	24.5%	143	100.0%
	Total		161	79.3%	42	20.7%	203	100.0%
Many	Using birth control	Yes	55	72.4%	21	27.6%	76	100.0%
		No	76	62.8%	45	37.2%	121	100.0%
	Total		131	66.5%	66	33.5%	197	100.0%

Perceived barriers	X^2	df	Sig.	OR	LCL	UCL
None	2.225	1	0.136	0.666	0.376	1.180
Some	4.226	1	0.040	0.477	0.224	1.013
Many	1.914	1	0.166	0.743	0.483	1.144

4.6.6.2. Risk taking

Among those adolescents who perceived none or some barriers to protective behaviours, the risk takers were 1.8 times more likely than the non-risk takers to have used a condom at last sex. Among those who perceived many barriers to protective behaviour there was, however, no significant difference in condom use between the risk takers and non-risk takers.

Table 48 Perception of barriers and risk taking

Perceived barriers			Used a condom at last sex				Total	
			No		Yes			
			N	%	N	%	N	%
None	Risk taking	No risk taking	77	73.3%	28	26.7%	105	100.0%
		Risk taking	43	52.4%	39	47.6%	82	100.0%
	Total		120	64.2%	67	35.8%	187	100.0%
Some	Risk taking	No risk taking	95	84.8%	17	15.2%	112	100.0%
		Risk taking	65	72.2%	25	27.8%	90	100.0%
	Total		160	79.2%	42	20.8%	202	100.0%
Many	Risk taking	No risk taking	74	69.8%	32	30.2%	106	100.0%
		Risk taking	56	62.2%	34	37.8%	90	100.0%
	Total		130	66.3%	66	33.7%	196	100.0%

Perceived barriers	X^2	df	Sig.	OR	LCL	UCL
None	8.743	1	0.003	1.784	1.207	2.635
Some	4.810	1	0.028	1.830	1.056	3.172
Many	1.255	1	0.263	1.251	0.845	1.853

4.6.7. Contraception

There was a significant interaction between contraceptive use and risk taking.

4.6.7.1. Risk taking

Among those using another birth control method there was no significant difference in

condom use between the risk takers and non-risk takers. Adolescents who were not using another birth control method and who had engaged in some risk taking activity were 1.5 times more likely to have used a condom at last sex.

Table 49 Contraceptive use and risk taking

Using birth control			Used a condom at last sex: No N	No %	Yes N	Yes %	Total N	Total %
Yes	Risk taking	No risk taking	94	81.7%	21	18.3%	115	100.0%
		Risk taking	42	71.2%	17	28.8%	59	100.0%
	Total		136	78.2%	38	21.8%	174	100.0%
No	Risk taking	No risk taking	152	73.1%	56	26.9%	208	100.0%
		Risk taking	122	60.1%	81	39.9%	203	100.0%
	Total		274	66.7%	137	33.3%	411	100.0%

Contraceptive use	X^2	df	Sig.	OR	LCL	UCL
Yes	2.544	1	0.111	1.578	0.904	2.754
No	7.787	1	0.005	1.482	1.120	1.962

4.6.8. Summary

A summary of the controlled analysis appears in table 45 and table 46. The odds ratio of the significant predictors appears in the last column of the tables. These results are discussed in more detail in Chapter Five.

Table 50 Controlled analysis summary (part 1)

Perception of risk (higher vs lower)		
Discussion with partner	Yes ***	2.2
	No ***	2.9
Perception of barriers	None ***	2.2
	Some ***	4.0
	Many ***	2.3
Using contraceptives	Yes ***	5.2
	No ***	2.2
Gender		
Locus of control (internal vs external)	Male ns	
	Female **	2.0
Perception of barriers (none vs many)	Male ns	
	Female ns	
Perception of barriers (some vs many)	Male ns	
	Female ***	0.3
Contraceptive use (yes vs no)	Male ns	
	Female ns	
Engaged in risk taking activities (no vs yes)	Male ns	
	Female ***	1.9
Health professional promoted condom use (yes vs no)		
Discussion with a partner	Yes ***	1.6
	No ***	1.8
Perception of barriers	None ***	2.0
	Some ns	
	Many ***	1.9
Contraceptive use	Yes ***	8.5
	No ***	1.6
Engaged in risk taking activities	No ***	2.6
	Yes ns	
Locus of control (internal vs external)		
Contraceptive use	Yes ***	4.7
	No *	1.5
Engaged in risk taking activities	No **	2.0
	Yes ns	
Perception of barriers	None **	1.7
	Some ns	
	Many *	1.6
Contraceptive use (yes vs no)		
Discussion with a partner	Yes ***	3.3
	No **	1.4
Engaged in risk taking activities (no vs yes)		
Discussion with a partner	Yes *	1.6
	No **	1.5
* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$		

Table 51 Controlled analysis summary (part 2)

Contraceptive use (yes vs no)		
Perception of barriers	None ns	
	Some *	0.5
	Many ns	
Engaged in risk taking activities (no vs yes)		
Perception of barriers	None **	1.8
	Some *	1.8
	Many ns	
Engaged in risk taking activities (no vs yes)		
Contraceptive use	Yes ns	
	No **	1.5
* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$		

5. Discussion

5.1. Overview

The final model, which included all the significant predictors and interactions accounted for 28.1% of the outcome (or variance). In his review of effect sizes in multiple regression equations, Cohen (1988, cited in Breakwell, Millward & Fife-Schaw, 1994) considers a large effect to be one where 26% or more of the variance is accounted for, compared with small (2%) and medium (13%) effects. It can therefore be concluded, on the basis of the Nagelkerke R^2 value, that this model provided an adequate fit of the data.

The significant predictors in the model were the perception of risk, the promotion of condom use by a health professional, locus of control, discussion with a partner, the perception of barriers, the use of contraceptives, and risk taking behaviour. The only interaction to be entered into the model was the interaction between health services and the use of other forms of contraception. Adolescents who were using another form of contraception, but who had had contact with a health professional who promoted condom use, were 8.5 times more likely to have used a condom at last sex, than those who had not been in contact with a health professional who promoted condom use.

Gender, was the second predictor to enter the model and was the ninth predictor to be removed when all significant interactions were included for analysis. In the light of these findings, separate analyses for male and female youth would have been useful. This was precluded, however, by the sample size when sub-samples of males and females were created.

Only one of the social context variables - health services - was a significant predictor. Health services accounted for only 3.6% of the outcome. This finding is explored in more detail later in the chapter.

In comparison to the small effect of the social context variables, the individual perceived environment variables, perceived risk and perceived barriers accounted for 15% of the overall outcome. Locus of control was the only factor from the personality domain that was included in the final model and it accounted for 2.2% of the outcome. Other sexual behaviours such as discussion with partner about protection and the use of other methods of contraception - which could influence condom use - accounted for 2% of the outcome. Risk taking activity involvement accounted for 0.9% of the outcome.

The following discussion will begin with an overview of the results of the univariate and individual domain analyses. This discussion will focus on offering an explanation for the observed relative importance of these domains in predicting condom use. A discussion of the individual significant predictors and their interactions will follow.

5.2. Domain analysis

5.2.1. Biological

Overall, the biological risk domain accounted for 5% of the outcome. This effect size is small but significant. This effect was due to the gender variable, as age was not a significant predictor in this domain.

Although younger age was associated with condom use in a number of studies (Irwin et al, 1998; Pendergrast et al, 1992; Reitman et al, 1996; Romer et al, 1994; St Lawerence,1993), no significant difference in condom use at last sex between younger and older adolescents was observed in this study.

The gender difference in condom use observed in other research (Breakwell, 1993 in Breakwell & Millward, 1997; Donald et al, 1994; Leland & Barth, 1993) was observed in this study. Gender and condom use will be discussed in more detail later in the chapter.

5.2.2. Proximate social context

Overall, the proximate social context did not significantly predict the outcome. This finding will be discussed in more detail, as it should not be interpreted as meaning that the immediate social context or family environment does not impact on adolescent condom use generally. This finding is likely to be the result of the variables used in this specific study to measure this domain.

Jemmott and Jemmott (1992) and Magnani et al (2000) found that condom use was more likely if the adolescent was currently living with both parents. The available measure in this study concerned family structure when the adolescent was 14 years old. This may explain why no significant difference in condom use was found in this study.

It was unsurprising that there was no significant association between condom use and the parent communication variable. The variable used in this study provided a basic

measurement of parent-adolescent communication on sexual matters. Jaccard (1995, cited in Jaccard, Dittus & Gordon, 1998) characterized the communication process between parents and adolescents in terms of five dimensions. These were the extent of the communication (measured in terms of frequency and depth); the style or manner in which information is communicated; the content of the information; the timing of the communication; the general family environment and overall quality of parent-adolescent relationship. Jaccard (ibid.) noted that when the complexity of the communication process was taken into account, parental communication variables revealed strong associations with the sexual and contraceptive behaviour of adolescents.

Further research that refines these measures is required before any conclusions on the impact of the immediate family context on condom use can be drawn.

5.2.3. Distal social context

The distal social context risk domain had a small but significant effect on condom use. This domain accounted for 5% of the outcome. While the level of sex education did not significantly impact on condom use at last sex, exposure to a health professional who promoted the use of condoms significantly and positively impacted on condom use at last sex. Health services in relation to condom use will be discussed in more detail later in the chapter.

In his review of sexuality and HIV/AIDS educational programs, Kirby (1997) noted that those that were effective had specific characteristics. Among these characteristics was: the

involvement of participants in a manner that allowed them to personalise information; addressed social pressures on sexual behaviours, and; provision of modelling and practice of communication, negotiation and refusal skills. It can be noted from Jack's (1996) review of South African Education Department's AIDS education programmes that none of these elements were present in the school sex education programs. It is therefore unsurprising that the adolescents who received sex education which simply covered more topics were no more likely to have used a condom at last sex.

5.2.4. Perceived environment - self

The perceived environment in relation to the self accounted for 15.8% of the outcome - a significant and medium effect. The perception of risk and the perception of barriers are discussed in more detail later in the chapter.

Knowledge was a significant predictor of condom use in the univariate analysis. Adolescents who had a below average sexual knowledge were 0.6 times less likely than those with an above average sexual knowledge to have used a condom at last sex. Knowledge did not, however, remain a significant predictor of condom use in the perceived environment risk domain binary logistic regression model. This is probably because while knowledge was necessary for behaviour change to become possible, it had a less significant impact on behaviour than the perception of risk and the perception of barriers. A detailed description of the perception of risk and the perception of barriers appears later in the chapter.

5.2.5. Perceived environment - peers

The perceived environment in relation to friends' behaviour accounted for 1.5% of the outcome. Considered as a whole, this domain was not significant in predicting condom use at last sex. None of the individual predictors were significant. Despite this, the variable measuring the perceived peer attitudes to condom (same sex friend showed a condom) approached significance. Adolescents who had been shown a condom by a same sex friend were 1.5 times more likely to have used a condom at last sex. It is not unlikely that a more direct measure of peer attitude to condom use would have produced a significant result.

5.2.6. Personality

The personality risk domain accounted for 3.5% of the outcome. The locus of control was the only significant predictor of condom use at last sex and is discussed in more detail later in the chapter. Goal or future orientation, self-esteem and fatalism were not significant predictors of condom use at last sex.

This may partially be the result of the measurement of these constructs. For example, this study showed no association between self-esteem and condom use. The measurement of this construct was poorly defined as it was based on a broad self-description. Rosenthal, Moore & Flynn (1991) argue that the body of research which clearly demonstrates that self-esteem is a multi-dimensional construct necessitates measures which go beyond the global measures of self-esteem and focus more precisely on the adolescents sexual world.

5.2.7. General behaviour

The general behaviour domain accounted for 3.4% of the outcome. Church attendance was not a significant predictor of condom use, although it was expected that adolescents who attended church more regularly would be more religious, less accepting of their sexuality and consequently less likely to plan and use a condom. This finding may once again be the outcome of the measurement construct. Zaleski and Schiaffino (2000) concluded that a stronger religious identification measured by the Allport and Ross' Religious Orientation Scale was associated with less condom use. The frequency of church attendance does not necessarily equate to identity salience, i.e., a given identity being invoked in a given situation. The frequency of church attendance does not mean that religious beliefs will be invoked in the context of decisions about sex (Sheeran, Abrams, Abraham & Spears, 1993).

5.2.8. Other sexual behaviours

The sexual behaviour risk domain accounted for 7% of the outcome. Previous pregnancies and number of partners were not significant predictors of condom use. Previous STIs approached significance. Adolescents who had had a STI were 1.7 times more likely to have used a condom at last sex. The use of other non-barrier birth control methods are discussed in more detail later in the chapter.

5.3. Significant predictors

5.3.1. Perception of risk

The perception of risk was the most important predictor of condom use at last sex. Those adolescents who perceived themselves to be at lower risk were 0.2 times less likely than those who perceived themselves to be at higher risk to have used a condom at last sex. This finding is consistent with other a number of studies (DiClemente et al, 1990; Donald et al, 1994; Malavaud et al, 1990) which reported that the perception of risk has been associated with more protective behaviours. When significant interactions between the predictors were controlled for, the perception of risk remained significantly associated with condom use.

Adolescents who had discussed protection with a partner and perceived a higher risk were 2.2 times more likely than those who perceived a lower risk to have used a condom at last sex. Adolescents who had not engaged in such discussion with partners but who perceived a higher risk were 2.9 times more likely to have used a condom at last sex. Therefore, in the absence of partner discussions, the perception of risk remained an important predictor of condom use. Seal and Palmer-Seal (1996) found that the most common reason that college dating couples did not use condoms or discuss safe sex was there was no perceived risk for exposure to HIV/STDs as the partner was known and trusted.

Irrespective of the perception of barriers to protective behaviour, those adolescents who perceived themselves to be at higher risk were more likely than those who perceived themselves to be at lower risk to have used a condom at last sex. Adolescents who perceived

many barriers to protective behaviour but perceived higher risk were 2.3 times less likely than those who perceived themselves to be at lower risk to have used a condom at last sex. This has important implications for the content of educational and awareness campaigns. These campaigns should personalise the risks of unprotected sexual intercourse, and focus on the positive aspects of condom use. Information on overcoming some of the barriers to condom use, such as physical discomfort with the use of contraceptive lubricants, should also be offered.

Those who were using methods of birth control other than the condom were 0.3 times less likely to have used a condom at last sex than those not using such methods. However, those using other birth control methods and who perceived themselves to be at higher risk were 5.2 times more likely to have used a condom at last sex. A higher perception of risk was associated with a greater likelihood of using dual protection against pregnancy, sexually transmitted diseases and HIV infection. Currently, there has not been much research into the nature of dual protection.

5.3.2. Gender

Although the biological domain had a significant effect size, this was largely due to the gender variable, as age was not a significant predictor. Further, in the first full model of significant domain predictors, gender was the second predictor to enter the model. It was therefore unexpected that in the final model (which included the all significant third order interactions), gender was removed at the second step.

An explanation for this result may lie in the premise that sex, as a strictly biological construct,

would not significantly impact condom use, despite the female's greater physical vulnerability to HIV infection (Interactive Population Centre, 2001). However, gender, as a social construction of biological sex would significantly impact condom use. Thus when the interactions between gender, contraceptive use and variables such as risk taking, locus of control and partner discussions were entered into the model, gender was removed.

Breakwell and Millward (1997) found that females with a high sexual assertiveness score were more likely to be sexually active, to have more sexual partners and to engage in risk taking activities such as alcohol consumption and cigarette smoking more frequently. While this assertiveness and detachment from social conventions was, however, linked to more sexual partnerships it was also linked to more frequent condom use. Richard and van der Plight (1994, cited in van der Plight & Richard, 1994) found that assertiveness was the most powerful predictor of condom use among adolescent females who were not in a monogamous relationship. For males, however, this factor explained little variance.

This study found that female adolescents who felt that their life was under their own control were twice as likely as those who felt life was under the control of others to have used a condom at last sex. Furthermore, if risk taking was understood as a positive move from social convention, the contention that gender as a social construction impacts on condom use is more strongly supported.

According to Smith and Rosenthal (1995) the role of risk taking in adolescent development is subject to competing explanatory frameworks. They cite the classical longitudinal study completed by Jessor and Jessor (1977, cited in Smith & Rosenthal, 1995) which focused on

the negative aspects of risk and problem behaviour syndrome. This model premises the co-variance of risk laden activities such as drinking, marijuana use and early sexual debut. This model has been extended to suggest that lower levels of self-reported health-protective behaviors may be part of the syndrome of problem behaviours. Within this framework the lack of condom use would be understood as part of a syndrome of problem behaviours.

Biglan et al (1990) found clear evidence that adolescents are more likely to engage in high-risk sexual behaviour (e.g., multiple partners, nonuse of condoms) when they are engaging in other forms of problem behaviour, including cigarette smoking, alcohol use, and illicit drug consumption. In particular, cigarette smoking was a strong and independent predictor of high risk sexual behaviour.

The competing framework argues that risk taking can be potentially adaptive rather than deviant; serving a positive, constructive role in adolescent development. Smith and Rosenthal (1995) cited the work of Chassin et al (1989) and Silbereisen & Noack (1988) to support this argument. The concept of risk taking behaviour as constructive is not immediately apparent. Chassin, Presson and Sherman (1989) clarify the theoretical framework by drawing on the work of social psychology and sociology. Within these disciplines conventionality is defined as high agreement between an individual and their social group. Deviance is then defined as rule breaking that occurs when the individual fails to conform to the norms and expectations of the social group. Adolescent sexual behaviour is proscribed and those who engage in sexual behaviour are regarded as not conforming to this norm. The argument develops that it is a mistake to view conformity-nonconformity as a single dimension. The opposite of conformity might either reflect true independence and autonomy from the norms of the group,

or it might reflect a reactant rebellious posture which is highly influenced by group norms but in a negative way. This rebellious nonconformity is termed anticonformity. Individuals who act in a independent or autonomous way are directed by a set of internal standards, which allows for creativity and innovation in behaviour.

In this study, females who had engaged in risk taking activities were 1.9 times more likely than those who had not engaged in risky activities to have used a condom at last sex. Condom use among females can therefore be linked to two aspects of self-concept - a sense of mastery and control (an internal locus of control) and a detachment from social convention (engagement in risk taking behaviour). Additional research that measures the impact of gender role attitudes on locus of control, risk taking and sexual behavior among adolescents females would be recommended.

Among males the perception of barriers did not significantly impact on condom use at last sex. Females who perceived no barriers were as likely as those who perceived many barriers to have used a condom at last sex. Females who perceived some barriers were 0.28 times less likely than those who perceived many barriers to have used a condom at last sex.

The lack of a clear and logical pattern may be explained by the cross-sectional nature of the study, as the timing of events and the development of attitudes was unknown. For some adolescents, attitudes towards the negative aspects of condom use may be formed on the basis of personal experience of condom use at last sex. Therefore, while a condom was used at last sex, it resulted in the formation of many negative attitudes towards condom use. Conversely, those females who perceived no barriers to condom use may have had a positive experience

with their use at last sex. For other young women, their attitudes may be formed on the basis of peer attitude and not on their own experience of condom use.

It seems reasonable to assume that male condom use was less likely to be influenced by perceived barriers than the use of the male condom reported by females. The use of the male condom was essentially under the control of the male partner and until recently the female partner had to negotiate its use with her partner.

The influence of the female condom on safer sex behaviours is still to be studied, although there is an assumption that as a method is under the control of the female partner it will improve the incidence of safer sex. This perception was highlighted by Preston-Whyte (1996). In a focus group, female participants indicated that the female condom would overcome the barriers to women protecting themselves. However, given that girls have little power or say in relationships and since condoms convey a mistrust of a partner or a presumption of infidelity of uncleanness (Varga, 1997), this would seem unlikely. The most important perceived barriers to condom use would not be overcome by a simple exchange from male to female condoms.

5.3.3. Health services

Contact with a health professional who promoted the use of condoms was the third most important predictor of condom use. Adolescents who had been in contact with a health professional who promoted condom use were four times more likely to have used a condom at last sex than those who had not had such contact.

Regardless of previous partner discussions about contraception and protection, those adolescents who had been in contact with a health professional who promoted condom use were more significantly more likely to have used a condom at last sex. It is important to note that, in the absence of such discussions with a partner, those adolescents who had been in contact with health professionals who encouraged condom use were 1.8 times more likely to have used a condom.

Among those adolescents who perceived many barriers to protective behavior, those who had been in contact with a health professional who promoted condom use were 1.9 times more likely than to have used a condom at last sex. Despite strong negative attitudes to condom use, therefore, when a health professional had promoted condom use they were more likely to be used.

Those adolescents who were using other birth control methods were 8.5 times more likely to have used a condom at last sex if they had had contact with a health professional who promoted condom use.

While these findings were positive, contact with a health professional who promoted condom use did not significantly impact on those adolescents who engaged in risk taking activities. These adolescents may be resistant to advice offered by authority figures. Overall, however, these findings have important implications for service delivery to adolescents. Despite a lack of partner discussion, the perception of many barriers and the use of other contraceptives, contact with a health professional who promoted condom use was significantly associated with condom use at last sex.

5.3.4. Locus of control

Locus of control was the fourth most important predictor of condom use at last sex. In the final model those who felt their life was controlled by others were 0.4 times less likely than those who felt life was under their own control to have used a condom.

Among those adolescents using contraceptives, those with an internal locus of control were 4.7 times more likely to have used a condom at last sex. A strong sense of mastery would be needed to ensure that condoms were used despite the fact that pregnancy had been protected against.

Those adolescents with an internal locus of control who did not engage in risk taking behaviour were twice as likely as those with an external locus of control to have used a condom at last sex. Among the risk takers, there was no significant difference in condom use between those with an external and those with an internal locus of control.

5.3.5. Discussion with partner

The fifth most important predictor of condom use at last sex was discussion about contraception and protection with a partner. Adolescents who had had discussions with a partner were 1.67 times more likely to have used a condom at last sex than those who had not had such discussions. This finding is consistent with previous research (Boldero et al, 1992; Donald et al, 1994; Ford & Norris, 1995; Shoop & Davidson, 1994).

Consistent across the perception of barriers, those adolescents who had discussed protection with a partner were approximately 1.6 times more likely to have used a condom at last sex. Even among the adolescents who perceived many barriers, those who had discussed protection with a partner were 1.6 times more likely to have used a condom than those who had not. Discussion with a partner appeared, therefore, to have diminished the impact of perception of barriers on condom use. This was expected as partner's perceived negative attitude to condom use and their anticipated negative reaction to a request for condom use are among the most important barriers to condom use.

Those adolescents who were using birth control were 3.3 times more likely to have used a condom at last sex if they had discussed protection with a partner. This finding was probably because of the specific definition of the content of partner discussions in this study. Cline et al (1992, in Seal & Palmer-Seal, 1996) noted that among partners who do report discussing safer sex, few reported talking about topics directly relevant to risk reduction such as condom use within their own relationship. This type of general communication has been found to be unrelated to condom use (Catania, 1989 in Shoop & Davidson, 1994).

When risk taking was controlled, those who had discussed protection with a partner were more likely than those who had not to have used a condom at last sex. This means that risk takers and non-risk takers were both more likely to have used a condom at last sex if they had discussed protection with a partner.

5.3.6. Barriers to protective behaviours

The perception of barriers to protective behaviour was the sixth most important predictor of condom use at last sex. Those adolescents who perceived no barriers to protective behaviour were 1.8 times more likely than those who perceived many barriers to have used a condom at last sex. Those who perceived some barriers were almost as likely as those who perceived many barriers to have used a condom at last sex.

The effect of using contraceptives on condom use at last sex was, however, only significant among those adolescents who perceived some barriers to protection. Those who used other birth control methods were 0.5 times less likely than those who had not used them to have used a condom. It would seem that those adolescents who perceived some barriers felt that they were adequately protected, at least from pregnancy, by the use of birth control methods.

Among those adolescents who perceived none or some barriers to protective behaviours the risk takers were 1.8 times more likely than the non-risk takers to have used a condom at last sex. Among those who perceived many barriers to protective behaviour there was, however, no significant difference in condom use between the risk takers and non-risk takers.

Abdool Karim et al (1992a) found that black high school students associated condom use with STIs. This was a result of widespread awareness that condom use is recommended for persons with STIs, as STI clinics routinely issue condoms as protection from re-infection. Varga (1997) noted that among young black South Africans that advocating and carrying condoms may be taken as evidence, not only of having a number of sexual partners but of

being HIV positive.

5.3.7. Contraception

Those adolescents who used a method of birth control other than the condom were 0.26 times less likely to have used a condom at last sex. This finding was consistent with other research (Critelli and Suire, 1998; Plichta et al, 1992; St Lawrence, 1993). Critelli and Suire (1998) noted that this finding was, however, dependent on the type of partner or relationship. They found that condom use was less likely if the relationship was defined as monogamous and other forms of birth control were used. Plichta et al (1992) found that consistent condom use did not vary significantly for different types of partners. Those in shorter relationships were more than twice as likely to be consistent condom users, regardless of the type of partner.

Reisen and Poppen (1995) found not only that condom was use related to duration of the relationship but many women had actually changed their behaviour. One third of the women reported that they used condoms more at the beginning of their relationships but had decreased the use over time and switched to other forms of contraception.

Hammer et al (1996) found that it was common for young people to switch from using condoms to using the pill as their main form of protection. Condoms were most often used in the beginning of relationships, until they knew their partner well and trusted them. This switch seems to symbolise the beginning of a trusting and committed long-term relationship.

Further research is necessary to understand the interaction between the type of relationship,

relationship duration and contraceptive use among South African adolescents.

Within the gender controlled analysis, it emerged that only 14 (4.8%) of the male adolescents had indicated that their partner was using another form of birth control. The actual extent to which their female partners use oral contraceptives and injectables was unknown but it seems likely that the male adolescents were largely unaware of their partner's contraceptive behaviour. Among the female youth, those who were using contraceptives were as likely as those who were not to have used a condom at last sex. Overall, 10.8% of the female youth appeared to have used dual methods for dual protection against both pregnancy and STI and HIV infection.

Among those using another birth control method, there was no significant difference in condom use between the risk takers and non-risk takers. Those who were not using another birth control method and who had engaged in some risk taking activity were 1.5 times more likely to have used a condom at last sex.

5.3.8. Risk taking

Adolescents who had had not engaged in any risk taking activity were half (0.55) as likely as those who had engaged in risk taking behaviour to have used a condom at last sex. The literature reviewed presented contradictory findings regarding the relationship between risk taking and contraceptive use. Some studies found that those who engaged in risk taking activities were less likely to use contraceptives to protect themselves during sexual intercourse (Brown, DiClemente & Park, 1992; Costa, Jessor, Fortenberry & Donovan, 1996;

Galavotti & Lovick, 1989; Hingson, Strunin, Berlin & Heeran, 1990; Richter, Valois, McKeown & Vincent, 1993 in Fortenberry et al, 1997). Others found no relationship between risk taking and contraceptive use (Choquet and Manfredit, 1992; Fortenberry et al, 1997).

A framework for understanding the relationship between risk taking and condom use is offered by Smith and Rosenthal (1995). They conducted a study to determine the structure of adolescent perception of risk. Adolescents rated ten activities, including alcohol use; cigarette smoking; the use of other drugs such as marijuana, inhalants and amphetamines; having sexual intercourse without a condom; and driving under the influence. Among the activities, the adolescents clearly identified two groups: higher risk activities and lower risk activities. Unprotected sexual intercourse was defined as a higher risk activity, along with the use of inhalants and amphetamines, driving under the influence and being a passenger in a vehicle driven by someone under the influence of drugs or alcohol. The lower risk activities included smoking cigarettes, drinking alcohol and consuming five or more alcoholic drinks on a single occasion. Therefore, while adolescents are perceived from an adult point of view to be engaging in risk taking activities such as alcohol and tobacco use, within their own perception these activities are low risk. Unprotected sex is, however, regarded as a high risk activity along with the use of drugs.

5.4. Conclusion

Much of the current research on adolescent sexual behaviour in South Africa is qualitative in nature or concentrates on knowledge, attitudes, practices and behaviour (KAPB) surveys.

This study attempted to address the deficiency in what was known about the factors, beyond knowledge and attitudes, which influence condom use. Although the immediate social context was not significantly associated with condom use, further research using improved measures of parental communication is required.

This study has found that the gender differences in condom use were diminished when female adolescents had generally more assertive and less conventional attitudes and behaviours. The impact of traditional gender role values on safer sex behaviours should be examined in greater detail.

The importance of the role of health professionals in encouraging condom use was highlighted in this study. Despite a lack of partner discussion, the perception of many barriers and the use of other contraceptives, contact with a health professional who promoted condom use was significantly associated with condom use. This has implications for the focus of health service provision to young people, particularly since the use of other methods of birth control was associated with a decreased likelihood of condom use.

The most important predictor of condom use was the perception of risk. Within this sample, those who perceived themselves to be at risk were more likely to have used a condom at last sex. It should be noted, however, that only consistent condom use provides protection against HIV infection. While the perception of risk may have overcome the perceived barriers to condom use at last sex, therefore, it is unknown whether or not it would predict consistent condom use.

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APPENDIX A

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
GENDER	2	Gender

DESIGN 1 has generating class

LASTSEX*ATTRISK*GENDER

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	3.827	.0504	3.806	.0511	3
2	4	80.938	.0000	79.422	.0000	2
1	7	245.522	.0000	281.675	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	164.583	.0000	202.253	.0000	0
2	3	77.111	.0000	75.616	.0000	0
3	1	3.827	.0504	3.806	.0511	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*GENDER

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*GENDER	1	3.827	.0504	3

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*GENDER
ATTRISK*GENDER

Likelihood ratio chi square = 3.82691 DF = 1 P = .050

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	58.379	.0000	2
LASTSEX*GENDER	1	18.128	.0000	2
ATTRISK*GENDER	1	.461	.4970	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*GENDER

Likelihood ratio chi square = 4.28818 DF = 2 P = .117

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	58.450	.0000	2
LASTSEX*GENDER	1	18.200	.0000	2

Step 3

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*GENDER

Likelihood ratio chi square = 4.28818 DF = 2 P = .117

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*GENDER

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 4.28818 DF = 2 P = .117
Pearson chi square = 4.24150 DF = 2 P = .120

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
HEALTHA	2	Health professional promoted con

DESIGN 1 has generating class

LASTSEX*ATTRISK*HEALTHA

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.002	.9673	.002	.9674	4
2	4	81.508	.0000	90.824	.0000	2
1	7	253.672	.0000	279.112	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	172.164	.0000	188.289	.0000	0
2	3	81.506	.0000	90.822	.0000	0
3	1	.002	.9673	.002	.9674	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*HEALTHA

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*HEALTHA	1	.002	.9673	4

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*HEALTHA
ATTRISK*HEALTHA

Likelihood ratio chi square = .00168 DF = 1 P = .967

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	52.332	.0000	2
LASTSEX*HEALTHA	1	14.185	.0002	2
ATTRISK*HEALTHA	1	2.752	.0972	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*HEALTHA

Likelihood ratio chi square = 2.75331 DF = 2 P = .252

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	58.450	.0000	2
LASTSEX*HEALTHA	1	20.304	.0000	2

Step 3

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*HEALTHA

Likelihood ratio chi square = 2.75331 DF = 2 P = .252

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*HEALTHA

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.75331 DF = 2 P = .252
Pearson chi square = 2.75442 DF = 2 P = .252

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
LOCUS	2	Locus of control

DESIGN 1 has generating class

LASTSEX*ATTRISK*LOCUS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.851	.3562	.833	.3615	4
2	4	76.564	.0000	73.512	.0000	2
1	7	383.350	.0000	437.586	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	306.786	.0000	364.074	.0000	0
2	3	75.712	.0000	72.679	.0000	0
3	1	.851	.3562	.833	.3615	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*LOCUS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*LOCUS	1	.851	.3562	4

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*LOCUS
ATTRISK*LOCUS

Likelihood ratio chi square = .85142 DF = 1 P = .356

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	61.738	.0000	2
LASTSEX*LOCUS	1	16.844	.0000	2
ATTRISK*LOCUS	1	3.706	.0542	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*LOCUS

Likelihood ratio chi square = 4.55733 DF = 2 P = .102

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	58.450	.0000	2
LASTSEX*LOCUS	1	13.556	.0002	2

Step 3

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*LOCUS

Likelihood ratio chi square = 4.55733 DF = 2 P = .102

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*LOCUS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 4.55733 DF = 2 P = .102
Pearson chi square = 4.47510 DF = 2 P = .107

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
DISCPART	2	Discussed contraception or prote

DESIGN 1 has generating class

LASTSEX*ATTRISK*DISCPART

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.218	.6409	.218	.6407	4
2	4	78.802	.0000	87.515	.0000	2
1	7	251.432	.0000	313.729	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	172.629	.0000	226.214	.0000	0
2	3	78.585	.0000	87.297	.0000	0
3	1	.218	.6409	.218	.6407	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*DISCPART

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*DISCPART	1	.218	.6409	4

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*DISCPART
ATTRISK*DISCPART

Likelihood ratio chi square = .21760 DF = 1 P = .641

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	52.340	.0000	2
LASTSEX*DISCPART	1	9.509	.0020	2
ATTRISK*DISCPART	1	4.514	.0336	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*DISCPART
ATTRISK*DISCPART

Likelihood ratio chi square = .21760 DF = 1 P = .641

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*DISCPART
ATTRISK*DISCPART

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .037
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .21760 DF = 1 P = .641
Pearson chi square = .21781 DF = 1 P = .641

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
BARRIERS	3	Perceived barriers to protective

DESIGN 1 has generating class

LASTSEX*ATTRISK*BARRIERS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	2.134	.3440	2.136	.3438	5
2	7	109.279	.0000	111.757	.0000	2
1	11	274.449	.0000	318.888	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	165.170	.0000	207.130	.0000	0
2	5	107.145	.0000	109.621	.0000	0
3	2	2.134	.3440	2.136	.3438	0

Backward Elimination (p = .050) for DESIGN 1 with generating class
LASTSEX*ATTRISK*BARRIERS
Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*BARRIERS	2	2.134	.3440	5

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*BARRIERS
ATTRISK*BARRIERS

Likelihood ratio chi square = 2.13421 DF = 2 P = .344

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	56.319	.0000	2
LASTSEX*BARRIERS	2	10.910	.0043	2
ATTRISK*BARRIERS	2	35.653	.0000	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*BARRIERS
ATTRISK*BARRIERS

Likelihood ratio chi square = 2.13421 DF = 2 P = .344

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*BARRIERS
ATTRISK*BARRIERS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .084
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.13421 DF = 2 P = .344
Pearson chi square = 2.13563 DF = 2 P = .344

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*ATTRISK*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	3.870	.0491	3.749	.0528	4
2	4	72.625	.0000	69.350	.0000	2
1	7	335.599	.0000	377.947	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	262.974	.0000	308.597	.0000	0
2	3	68.755	.0000	65.601	.0000	0
3	1	3.870	.0491	3.749	.0528	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*USECONTR	1	3.870	.0491	4

Step 1

The best model has generating class

LASTSEX*ATTRISK*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

The final model has generating class

LASTSEX*ATTRISK*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
ATTRISK	2	Perception of risk
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*ATTRISK*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.671	.4128	.671	.4128	4
2	4	72.615	.0000	72.334	.0000	2
1	7	240.990	.0000	285.414	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	168.375	.0000	213.079	.0000	0
2	3	71.945	.0000	71.664	.0000	0
3	1	.671	.4128	.671	.4128	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*ATTRISK*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK*RISKTAKE	1	.671	.4128	4

Step 1

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*RISKTAKE
ATTRISK*RISKTAKE

Likelihood ratio chi square = .67065 DF = 1 P = .413

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	59.278	.0000	2
LASTSEX*RISKTAKE	1	14.045	.0002	2
ATTRISK*RISKTAKE	1	1.381	.2399	2

Step 2

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*RISKTAKE

Likelihood ratio chi square = 2.05177 DF = 2 P = .358

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*ATTRISK	1	57.899	.0000	2
LASTSEX*RISKTAKE	1	12.665	.0004	2

Step 3

The best model has generating class

LASTSEX*ATTRISK
LASTSEX*RISKTAKE

Likelihood ratio chi square = 2.05177 DF = 2 P = .358

The final model has generating class

LASTSEX*ATTRISK
LASTSEX*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.05177 DF = 2 P = .358
Pearson chi square = 2.04317 DF = 2 P = .360

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
HEALTHA	2	Health professional promoted con

DESIGN 1 has generating class

LASTSEX*GENDER*HEALTHA

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	2.465	.1164	2.408	.1207	4
2	4	44.711	.0000	39.337	.0000	2
1	7	150.932	.0000	129.416	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	106.221	.0000	90.079	.0000	0
2	3	42.245	.0000	36.929	.0000	0
3	1	2.465	.1164	2.408	.1207	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*HEALTHA

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*HEALTHA	1	2.465	.1164	4

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*HEALTHA
GENDER*HEALTHA

Likelihood ratio chi square = 2.46546 DF = 1 P = .116

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	20.755	.0000	2
LASTSEX*HEALTHA	1	22.860	.0000	2
GENDER*HEALTHA	1	3.741	.0531	2

Step 2

The best model has generating class

LASTSEX*GENDER
LASTSEX*HEALTHA

Likelihood ratio chi square = 6.20676 DF = 2 P = .045

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	18.200	.0000	2
LASTSEX*HEALTHA	1	20.304	.0000	2

Step 3

The best model has generating class

LASTSEX*GENDER
LASTSEX*HEALTHA

Likelihood ratio chi square = 6.20676 DF = 2 P = .045

The final model has generating class

LASTSEX*GENDER
LASTSEX*HEALTHA

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 6.20676 DF = 2 P = .045
Pearson chi square = 6.00338 DF = 2 P = .050

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
LOCUS	2	Locus of control

DESIGN 1 has generating class

LASTSEX*GENDER*LOCUS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.483	.4869	.483	.4870	4
2	4	45.510	.0000	48.577	.0000	2
1	7	286.354	.0000	264.012	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	240.844	.0000	215.435	.0000	0
2	3	45.027	.0000	48.094	.0000	0
3	1	.483	.4869	.483	.4870	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*LOCUS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*LOCUS	1	.483	.4869	4

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*LOCUS
GENDER*LOCUS

Likelihood ratio chi square = .48326 DF = 1 P = .487

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	13.911	.0002	2
LASTSEX*LOCUS	1	9.267	.0023	2
GENDER*LOCUS	1	13.271	.0003	2

Step 2

The best model has generating class

LASTSEX*GENDER
LASTSEX*LOCUS
GENDER*LOCUS

Likelihood ratio chi square = .48326 DF = 1 P = .487

The final model has generating class

LASTSEX*GENDER
LASTSEX*LOCUS
GENDER*LOCUS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .021
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .48326 DF = 1 P = .487
Pearson chi square = .48317 DF = 1 P = .487

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
DISCPART	2	Discussed contraception or prote

DESIGN 1 has generating class

LASTSEX*GENDER*DISCPART

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	3.827	.0504	3.803	.0512	2
2	4	37.647	.0000	35.800	.0000	2
1	7	144.334	.0000	146.697	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	106.687	.0000	110.897	.0000	0
2	3	33.820	.0000	31.997	.0000	0
3	1	3.827	.0504	3.803	.0512	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*DISCPART

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*DISCPART	1	3.827	.0504	2

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*DISCPART
GENDER*DISCPART

Likelihood ratio chi square = 3.82664 DF = 1 P = .050

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	17.748	.0000	2
LASTSEX*DISCPART	1	15.168	.0001	2
GENDER*DISCPART	1	.001	.9813	2

Step 2

The best model has generating class

LASTSEX*GENDER
LASTSEX*DISCPART

Likelihood ratio chi square = 3.82719 DF = 2 P = .148

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	18.200	.0000	2
LASTSEX*DISCPART	1	15.620	.0001	2

Step 3

The best model has generating class

LASTSEX*GENDER
LASTSEX*DISCPART

Likelihood ratio chi square = 3.82719 DF = 2 P = .148

The final model has generating class

LASTSEX*GENDER
LASTSEX*DISCPART

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 3.82719 DF = 2 P = .148
Pearson chi square = 3.80257 DF = 2 P = .149

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
BARRIERS	3	Perceived barriers to protective

DESIGN 1 has generating class

LASTSEX*GENDER*BARRIERS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	4.016	.1342	3.941	.1394	4
2	7	60.071	.0000	59.469	.0000	2
1	11	159.299	.0000	154.404	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	99.228	.0000	94.934	.0000	0
2	5	56.055	.0000	55.529	.0000	0
3	2	4.016	.1342	3.941	.1394	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*BARRIERS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*BARRIERS	2	4.016	.1342	4

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*BARRIERS
GENDER*BARRIERS

Likelihood ratio chi square = 4.01634 DF = 2 P = .134

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	16.980	.0000	2
LASTSEX*BARRIERS	2	11.822	.0027	2
GENDER*BARRIERS	2	24.814	.0000	2

Step 2

The best model has generating class

LASTSEX*GENDER
LASTSEX*BARRIERS
GENDER*BARRIERS

Likelihood ratio chi square = 4.01634 DF = 2 P = .134

The final model has generating class

LASTSEX*GENDER
LASTSEX*BARRIERS
GENDER*BARRIERS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .088
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 4.01634 DF = 2 P = .134
Pearson chi square = 3.94077 DF = 2 P = .139

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*GENDER*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.566	.4519	.580	.4462	6
2	4	212.660	.0000	197.371	.0000	2
1	7	409.691	.0000	365.136	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	197.031	.0000	167.765	.0000	0
2	3	212.094	.0000	196.791	.0000	0
3	1	.566	.4519	.580	.4462	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*USECONTR	1	.566	.4519	6

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*USECONTR
GENDER*USECONTR

Likelihood ratio chi square = .56579 DF = 1 P = .452

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	10.499	.0012	2
LASTSEX*USECONTR	1	.412	.5209	2
GENDER*USECONTR	1	185.782	.0000	2

Step 2

The best model has generating class

LASTSEX*GENDER
GENDER*USECONTR

Likelihood ratio chi square = .97793 DF = 2 P = .613

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	18.200	.0000	2
GENDER*USECONTR	1	193.482	.0000	2

Step 3

The best model has generating class

LASTSEX*GENDER
GENDER*USECONTR

Likelihood ratio chi square = .97793 DF = 2 P = .613

The final model has generating class

LASTSEX*GENDER
GENDER*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .97793 DF = 2 P = .613
Pearson chi square = .98231 DF = 2 P = .612

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
GENDER	2	Gender
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*GENDER*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	3.000	.0833	3.025	.0820	4
2	4	67.330	.0000	71.162	.0000	2
1	7	170.906	.0000	190.125	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	103.576	.0000	118.963	.0000	0
2	3	64.330	.0000	68.136	.0000	0
3	1	3.000	.0833	3.025	.0820	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*GENDER*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER*RISKTAKE	1	3.000	.0833	4

Step 1

The best model has generating class

LASTSEX*GENDER
LASTSEX*RISKTAKE
GENDER*RISKTAKE

Likelihood ratio chi square = 2.99987 DF = 1 P = .083

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*GENDER	1	12.186	.0005	2
LASTSEX*RISKTAKE	1	6.620	.0101	2
GENDER*RISKTAKE	1	33.433	.0000	2

Step 2

The best model has generating class

LASTSEX*GENDER
LASTSEX*RISKTAKE
GENDER*RISKTAKE

Likelihood ratio chi square = 2.99987 DF = 1 P = .083

The final model has generating class

LASTSEX*GENDER
LASTSEX*RISKTAKE
GENDER*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .093
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.99987 DF = 1 P = .083
Pearson chi square = 3.02520 DF = 1 P = .082

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
HEALTHA	2	Health professional promoted con
LOCUS	2	Locus of control

DESIGN 1 has generating class

LASTSEX*HEALTHA*LOCUS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	2.564	.1094	2.657	.1031	2
2	4	36.479	.0000	36.895	.0000	2
1	7	284.904	.0000	264.830	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	248.424	.0000	227.934	.0000	0
2	3	33.916	.0000	34.239	.0000	0
3	1	2.564	.1094	2.657	.1031	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*HEALTHA*LOCUS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA*LOCUS	1	2.564	.1094	2

Step 1

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*LOCUS
HEALTHA*LOCUS

Likelihood ratio chi square = 2.56355 DF = 1 P = .109

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA	1	19.576	.0000	2
LASTSEX*LOCUS	1	12.827	.0003	2
HEALTHA*LOCUS	1	.056	.8133	2

Step 2

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*LOCUS

Likelihood ratio chi square = 2.61932 DF = 2 P = .270

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA	1	20.304	.0000	2
LASTSEX*LOCUS	1	13.556	.0002	2

Step 3

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*LOCUS

Likelihood ratio chi square = 2.61932 DF = 2 P = .270

The final model has generating class

LASTSEX*HEALTHA
LASTSEX*LOCUS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.61932 DF = 2 P = .270
Pearson chi square = 2.73943 DF = 2 P = .254

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
HEALTHA	2	Health professional promoted con
DISCPART	2	Discussed contraception or prote

DESIGN 1 has generating class

LASTSEX*HEALTHA*DISCPART

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.003	.9582	.003	.9584	4
2	4	50.884	.0000	55.644	.0000	2
1	7	165.151	.0000	161.116	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	114.268	.0000	105.472	.0000	0
2	3	50.881	.0000	55.641	.0000	0
3	1	.003	.9582	.003	.9584	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*HEALTHA*DISCPART

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA*DISCPART	1	.003	.9582	4

Step 1

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*DISCPART
HEALTHA*DISCPART

Likelihood ratio chi square = .00274 DF = 1 P = .958

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA	1	15.071	.0001	2
LASTSEX*DISCPART	1	10.387	.0013	2
HEALTHA*DISCPART	1	14.957	.0001	2

Step 2

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*DISCPART
HEALTHA*DISCPART

Likelihood ratio chi square = .00274 DF = 1 P = .958

The final model has generating class

LASTSEX*HEALTHA
LASTSEX*DISCPART
HEALTHA*DISCPART

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .034
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00274 DF = 1 P = .958
Pearson chi square = .00272 DF = 1 P = .958

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
HEALTHA	2	Health professional promoted con
BARRIERS	3	Perceived barriers to protective

DESIGN 1 has generating class

LASTSEX*HEALTHA*BARRIERS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	1.743	.4183	1.765	.4137	4
2	7	52.994	.0000	52.819	.0000	2
1	11	159.803	.0000	147.739	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	106.808	.0000	94.920	.0000	0
2	5	51.251	.0000	51.054	.0000	0
3	2	1.743	.4183	1.765	.4137	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*HEALTHA*BARRIERS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA*BARRIERS	2	1.743	.4183	4

Step 1

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*BARRIERS
HEALTHA*BARRIERS

Likelihood ratio chi square = 1.74299 DF = 2 P = .418

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA	1	19.561	.0000	2
LASTSEX*BARRIERS	2	12.299	.0021	2
HEALTHA*BARRIERS	2	17.906	.0001	2

Step 2

The best model has generating class

LASTSEX*HEALTHA
LASTSEX*BARRIERS
HEALTHA*BARRIERS

Likelihood ratio chi square = 1.74299 DF = 2 P = .418

The final model has generating class

LASTSEX*HEALTHA
LASTSEX*BARRIERS
HEALTHA*BARRIERS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .059
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 1.74299 DF = 2 P = .418
Pearson chi square = 1.76540 DF = 2 P = .414

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
HEALTHA	2	Health professional promoted con
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*HEALTHA*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	6.938	.0084	5.729	.0167	4
2	4	56.186	.0000	43.106	.0000	2
1	7	260.798	.0000	222.472	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	204.612	.0000	179.366	.0000	0
2	3	49.248	.0000	37.377	.0000	0
3	1	6.938	.0084	5.729	.0167	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*HEALTHA*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA*USECONTR	1	6.938	.0084	4

Step 1

The best model has generating class

LASTSEX*HEALTHA*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

The final model has generating class

LASTSEX*HEALTHA*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
HEALTHA	2	Health professional promoted con
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*HEALTHA*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	4.139	.0419	4.116	.0425	3
2	4	38.569	.0000	37.883	.0000	2
1	7	149.752	.0000	141.304	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	111.183	.0000	103.421	.0000	0
2	3	34.430	.0000	33.767	.0000	0
3	1	4.139	.0419	4.116	.0425	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*HEALTHA*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*HEALTHA*RISKTAKE	1	4.139	.0419	3

Step 1

The best model has generating class

LASTSEX*HEALTHA*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

The final model has generating class

LASTSEX*HEALTHA*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
LOCUS	2	Locus of control
DISCPART	2	Discussed contraception or prote

DESIGN 1 has generating class

LASTSEX*LOCUS*DISCPART

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.017	.8953	.017	.8954	3
2	4	31.060	.0000	32.212	.0000	2
1	7	279.949	.0000	268.891	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	248.890	.0000	236.679	.0000	0
2	3	31.042	.0000	32.195	.0000	0
3	1	.017	.8953	.017	.8954	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*LOCUS*DISCPART

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS*DISCPART	1	.017	.8953	3

Step 1

The best model has generating class

LASTSEX*LOCUS
LASTSEX*DISCPART
LOCUS*DISCPART

Likelihood ratio chi square = .01731 DF = 1 P = .895

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS	1	11.739	.0006	2
LASTSEX*DISCPART	1	13.803	.0002	2
LOCUS*DISCPART	1	1.866	.1719	2

Step 2

The best model has generating class

LASTSEX*LOCUS
LASTSEX*DISCPART

Likelihood ratio chi square = 1.88377 DF = 2 P = .390

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS	1	13.556	.0002	2
LASTSEX*DISCPART	1	15.620	.0001	2

Step 3

The best model has generating class

LASTSEX*LOCUS
LASTSEX*DISCPART

Likelihood ratio chi square = 1.88377 DF = 2 P = .390

The final model has generating class

LASTSEX*LOCUS
LASTSEX*DISCPART

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 1.88377 DF = 2 P = .390
Pearson chi square = 1.87674 DF = 2 P = .391

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
LOCUS	2	Locus of control
BARRIERS	3	Perceived barriers to protective

DESIGN 1 has generating class

LASTSEX*LOCUS*BARRIERS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	2.157	.3402	2.132	.3444	3
2	7	31.502	.0001	31.278	.0001	2
1	11	272.932	.0000	255.596	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	241.431	.0000	224.318	.0000	0
2	5	29.345	.0000	29.147	.0000	0
3	2	2.157	.3402	2.132	.3444	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*LOCUS*BARRIERS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS*BARRIERS	2	2.157	.3402	3

Step 1

The best model has generating class

LASTSEX*LOCUS
LASTSEX*BARRIERS
LOCUS*BARRIERS

Likelihood ratio chi square = 2.15654 DF = 2 P = .340

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS	1	12.555	.0004	2
LASTSEX*BARRIERS	2	12.041	.0024	2
LOCUS*BARRIERS	2	2.748	.2532	2

Step 2

The best model has generating class

LASTSEX*LOCUS
LASTSEX*BARRIERS

Likelihood ratio chi square = 4.90405 DF = 4 P = .297

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS	1	13.556	.0002	2
LASTSEX*BARRIERS	2	13.042	.0015	2

Step 3

The best model has generating class

LASTSEX*LOCUS
LASTSEX*BARRIERS

Likelihood ratio chi square = 4.90405 DF = 4 P = .297

The final model has generating class

LASTSEX*LOCUS
LASTSEX*BARRIERS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 4.90405 DF = 4 P = .297
Pearson chi square = 4.82055 DF = 4 P = .306

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
LOCUS	2	Locus of control
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*LOCUS*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	4.107	.0427	3.663	.0556	3
2	4	26.084	.0000	23.383	.0001	2
1	7	365.318	.0000	364.891	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	339.234	.0000	341.508	.0000	0
2	3	21.977	.0001	19.719	.0002	0
3	1	4.107	.0427	3.663	.0556	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*LOCUS*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS*USECONTR	1	4.107	.0427	3

Step 1

The best model has generating class

LASTSEX*LOCUS*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

The final model has generating class

LASTSEX*LOCUS*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
LOCUS	2	Locus of control
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*LOCUS*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.437	.5084	.439	.5074	3
2	4	38.786	.0000	41.032	.0000	2
1	7	285.096	.0000	264.080	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	246.310	.0000	223.048	.0000	0
2	3	38.349	.0000	40.593	.0000	0
3	1	.437	.5084	.439	.5074	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*LOCUS*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS*RISKTAKE	1	.437	.5084	3

Step 1

The best model has generating class

LASTSEX*LOCUS
LASTSEX*RISKTAKE
LOCUS*RISKTAKE

Likelihood ratio chi square = .43727 DF = 1 P = .508

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*LOCUS	1	9.960	.0016	2
LASTSEX*RISKTAKE	1	9.254	.0024	2
LOCUS*RISKTAKE	1	12.312	.0004	2

Step 2

The best model has generating class

LASTSEX*LOCUS
LASTSEX*RISKTAKE
LOCUS*RISKTAKE

Likelihood ratio chi square = .43727 DF = 1 P = .508

The final model has generating class

LASTSEX*LOCUS
LASTSEX*RISKTAKE
LOCUS*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .189
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .43727 DF = 1 P = .508
Pearson chi square = .43943 DF = 1 P = .507

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
DISCPART	2	Discussed contraception or prote
BARRIERS	3	Perceived barriers to protective

DESIGN 1 has generating class

LASTSEX*DISCPART*BARRIERS

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	.252	.8816	.252	.8816	4
2	7	53.166	.0000	53.490	.0000	2
1	11	160.440	.0000	166.710	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	107.274	.0000	113.220	.0000	0
2	5	52.914	.0000	53.238	.0000	0
3	2	.252	.8816	.252	.8816	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*DISCPART*BARRIERS

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*DISCPART*BARRIERS	2	.252	.8816	4

Step 1

The best model has generating class

LASTSEX*DISCPART
LASTSEX*BARRIERS
DISCPART*BARRIERS

Likelihood ratio chi square = .25194 DF = 2 P = .882

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*DISCPART	1	15.048	.0001	2
LASTSEX*BARRIERS	2	12.470	.0020	2
DISCPART*BARRIERS	2	24.252	.0000	2

Step 2

The best model has generating class

LASTSEX*DISCPART
LASTSEX*BARRIERS
DISCPART*BARRIERS

Likelihood ratio chi square = .25194 DF = 2 P = .882

The final model has generating class

LASTSEX*DISCPART
LASTSEX*BARRIERS
DISCPART*BARRIERS

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .081
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .25194 DF = 2 P = .882
Pearson chi square = .25197 DF = 2 P = .882

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
DISCPART	2	Discussed contraception or prote
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*DISCPART*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	4.384	.0363	4.211	.0402	3
2	4	32.504	.0000	27.571	.0000	2
1	7	237.581	.0000	232.802	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	205.077	.0000	205.231	.0000	0
2	3	28.120	.0000	23.360	.0000	0
3	1	4.384	.0363	4.211	.0402	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*DISCPART*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*DISCPART*USECONTR	1	4.384	.0363	3

Step 1

The best model has generating class

LASTSEX*DISCPART*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

The final model has generating class

LASTSEX*DISCPART*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
DISCPART	2	Discussed contraception or prote
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*DISCPART*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.007	.9345	.007	.9347	3
2	4	34.090	.0000	37.411	.0000	2
1	7	145.740	.0000	161.872	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	111.650	.0000	124.460	.0000	0
2	3	34.083	.0000	37.405	.0000	0
3	1	.007	.9345	.007	.9347	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*DISCPART*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*DISCPART*RISKTAKE	1	.007	.9345	3

Step 1

The best model has generating class

LASTSEX*DISCPART
LASTSEX*RISKTAKE
DISCPART*RISKTAKE

Likelihood ratio chi square = .00674 DF = 1 P = .935

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*DISCPART	1	12.873	.0003	2
LASTSEX*RISKTAKE	1	9.843	.0017	2
DISCPART*RISKTAKE	1	5.723	.0167	2

Step 2

The best model has generating class

LASTSEX*DISCPART
LASTSEX*RISKTAKE
DISCPART*RISKTAKE

Likelihood ratio chi square = .00674 DF = 1 P = .935

The final model has generating class

LASTSEX*DISCPART
LASTSEX*RISKTAKE
DISCPART*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.

The maximum difference between observed and fitted marginal totals is .117
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00674 DF = 1 P = .935
Pearson chi square = .00670 DF = 1 P = .935

DATA Information

587 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
0 cases rejected because of missing data.
587 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
BARRIERS	3	Perceived barriers to protective
USECONTR	2	Using contraceptives

DESIGN 1 has generating class

LASTSEX*BARRIERS*USECONTR

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	.720	.6977	.704	.7034	3
2	7	36.478	.0000	34.968	.0000	2
1	11	234.096	.0000	220.189	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	197.618	.0000	185.221	.0000	0
2	5	35.759	.0000	34.264	.0000	0
3	2	.720	.6977	.704	.7034	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*BARRIERS*USECONTR

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*BARRIERS*USECONTR	2	.720	.6977	3

Step 1

The best model has generating class

LASTSEX*BARRIERS
LASTSEX*USECONTR
BARRIERS*USECONTR

Likelihood ratio chi square = .71979 DF = 2 P = .698

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*BARRIERS	2	13.063	.0015	2
LASTSEX*USECONTR	1	8.134	.0043	2
BARRIERS*USECONTR	2	14.604	.0007	2

Step 2

The best model has generating class

LASTSEX*BARRIERS
LASTSEX*USECONTR
BARRIERS*USECONTR

Likelihood ratio chi square = .71979 DF = 2 P = .698

The final model has generating class

LASTSEX*BARRIERS
LASTSEX*USECONTR
BARRIERS*USECONTR

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .087
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .71979 DF = 2 P = .698
Pearson chi square = .70362 DF = 2 P = .703

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
BARRIERS	3	Perceived barriers to protective
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*BARRIERS*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	1.867	.3931	1.871	.3924	3
2	7	27.867	.0002	27.203	.0003	2
1	11	131.946	.0000	133.749	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	104.079	.0000	106.546	.0000	0
2	5	26.000	.0001	25.332	.0001	0
3	2	1.867	.3931	1.871	.3924	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*BARRIERS*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*BARRIERS*RISKTAKE	2	1.867	.3931	3

Step 1

The best model has generating class

LASTSEX*BARRIERS
LASTSEX*RISKTAKE
BARRIERS*RISKTAKE

Likelihood ratio chi square = 1.86740 DF = 2 P = .393

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*BARRIERS	2	13.163	.0014	2
LASTSEX*RISKTAKE	1	12.921	.0003	2
BARRIERS*RISKTAKE	2	.429	.8071	2

Step 2

The best model has generating class

LASTSEX*BARRIERS
LASTSEX*RISKTAKE

Likelihood ratio chi square = 2.29606 DF = 4 P = .681

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*BARRIERS	2	12.906	.0016	2
LASTSEX*RISKTAKE	1	12.665	.0004	2

Step 3

The best model has generating class

LASTSEX*BARRIERS
LASTSEX*RISKTAKE

Likelihood ratio chi square = 2.29606 DF = 4 P = .681

The final model has generating class

LASTSEX*BARRIERS
LASTSEX*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = 2.29606 DF = 4 P = .681
Pearson chi square = 2.29002 DF = 4 P = .683

DATA Information

585 unweighted cases accepted.
0 cases rejected because of out-of-range factor values.
2 cases rejected because of missing data.
585 weighted cases will be used in the analysis.

FACTOR Information

Factor	Level	Label
LASTSEX	2	Used a condom at last sex
USECONTR	2	Using contraceptives
RISKTAKE	2	Risk taking

DESIGN 1 has generating class

LASTSEX*USECONTR*RISKTAKE

Note: For saturated models .500 has been added to all observed cells.
This value may be changed by using the CRITERIA = DELTA subcommand.

The Iterative Proportional Fit algorithm converged at iteration 1.
The maximum difference between observed and fitted marginal totals is .000
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00000 DF = 0 P = 1.000
Pearson chi square = .00000 DF = 0 P = 1.000

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	1	.000	.9899	.000	.9900	3
2	4	30.321	.0000	32.259	.0000	2
1	7	232.645	.0000	222.043	.0000	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	3	202.324	.0000	189.784	.0000	0
2	3	30.321	.0000	32.259	.0000	0
3	1	.000	.9899	.000	.9900	0

Backward Elimination (p = .050) for DESIGN 1 with generating class

LASTSEX*USECONTR*RISKTAKE

Likelihood ratio chi square = .00000 DF = 0 P = 1.000

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*USECONTR*RISKTAKE	1	.000	.9899	3

Step 1

The best model has generating class

LASTSEX*USECONTR
LASTSEX*RISKTAKE
USECONTR*RISKTAKE

Likelihood ratio chi square = .00016 DF = 1 P = .990

If Deleted Simple Effect is	DF	L.R. Chisq Change	Prob	Iter
LASTSEX*USECONTR	1	5.619	.0178	2
LASTSEX*RISKTAKE	1	10.290	.0013	2
USECONTR*RISKTAKE	1	9.661	.0019	2

Step 2

The best model has generating class

LASTSEX*USECONTR
LASTSEX*RISKTAKE
USECONTR*RISKTAKE

Likelihood ratio chi square = .00016 DF = 1 P = .990

The final model has generating class

LASTSEX*USECONTR
LASTSEX*RISKTAKE
USECONTR*RISKTAKE

The Iterative Proportional Fit algorithm converged at iteration 0.
The maximum difference between observed and fitted marginal totals is .119
and the convergence criterion is .250

Goodness-of-fit test statistics

Likelihood ratio chi square = .00016 DF = 1 P = .990
Pearson chi square = .00016 DF = 1 P = .990