

**AN EVALUATION OF A SEXUALITY EDUCATION PROGRAM
FOR ADOLESCENTS**

by

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the requirements for the degree of
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ABSTRACT

The purpose of this investigation is to evaluate the S.T.A.R. program as it was implemented at a Catholic secondary school in London, Ontario. The study has three goals. The first of these is to measure the extent to which the program is implemented in accordance with the curriculum. The second aim is to ascertain the extent to which the intervention produces changes in the knowledge, attitudes and behaviour of program participants. The key question with respect to this objective is whether the S.T.A.R. program is more successful in eliciting changes than the regular curriculum. Third, the theoretical underpinnings of the program are assessed.

A pretest post-test non-equivalent comparison group (also called comparative change) design is employed. Changes in the knowledge, attitudes and behaviour of program participants are compared to changes that occur in the comparison group. Differences in the knowledge and attitudes of sexually active and abstinent students are measured in order to assess the program theory.

The S.T.A.R. program is, at best, marginally better than the existing sexuality education curriculum. It produces changes in knowledge, but demonstrates a lack of impact on attitudes and behaviour. Students who have engaged in sexual intercourse during the previous three months differ from those who have not in terms of their knowledge of emotions and relationships, knowledge of fertility and sexual permissiveness. These differences lend support to the program theory, which states that these factors have implications for sexual behaviour. Principal concerns related to the quality of the evaluation involve the brevity of the post-test period and the inability to link

individual cases across the pretest and post-test.

Keywords: Sexuality education, adolescents, evaluation

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CHAPTER I

Introduction and Review of Literature

Introduction

The purpose of this investigation is to identify important issues in the field of sexuality education for adolescents. Virtually all educational programs dealing with teenage sexuality have common components. They identify a role for information, they define attitudes as relevant, and they perceive teenage pregnancy and sexually transmitted diseases as problems to be avoided. A major disagreement is over the issue of whether the primary objective of the program should be abstinence from intercourse or whether the goal is to encourage responsible or “safer” sex if intercourse occurs. A review of various approaches to sexuality education and their theoretical underpinnings will be preceded by an examination of the nature of teenage relationships and sexuality.

Sexual Decision-Making Among Adolescents

The Social Context

The social environment of adolescents has changed considerably in recent decades. Smaller family size, more single parent homes, and a rise in the proportion of families where both parents are employed outside the home have led to a situation where not only homes, but entire neighbourhoods, have far fewer adults present during the day than in past decades. As a result, adolescents are being left unsupervised more often and for longer periods. This means not only that they have more opportunities for sexual activity, but that they are being forced into making choices about sexual behaviour at younger ages (Voydanoff and Donnelly, 1990: 22-3; Howard, 1992: 182). In a study conducted in Toronto by Herold (1984: 62) in 1975, 60 percent of sexually active teenage females

reported that the most frequent place for intercourse was their boyfriend's home when parents were absent, especially when sex occurred during the daytime.

Adolescents' decision-making is likely complicated by their perception that there a discrepancy exists between the views of their parents and those of their peers. Herold reports that 86 percent of sexually active females and 68 percent of their male counterparts say that their parents would be upset if it was discovered that they were having sex. Only a third of the females and 13 percent of the males, however, indicate that their friends would be upset (Herold, 1984: 12). Although teenagers believe that their parents do not want them to have sex, adolescents are faced with changing social norms and attitudes that increasingly condone premarital sex among adults. According to Hayes (1987: 19), cohabitation and premarital sex among adults are becoming increasingly common. The results of a survey conducted in 1982 by Reginald Bibby indicate that 74 percent of adult Canadians believe that premarital sex is "not wrong at all" or wrong only "sometimes". Adults under the age of thirty are even more accepting of premarital sex (Herold, 1984: 4). Portrayals of sex among adults on television generally take place outside of marriage, and there is usually no discussion of possible consequences such as pregnancy or sexually transmitted disease (Voydanoff and Donnelly, 1990: 25). Hayes remarks that "television programming and advertising in general provide young people with lots of clues about how to be sexy, but they provide little information about how to be sexually responsible" (1987: 91).

The Developmental Context

Early adolescence is the period when discontinuity between physical development and emotional, psychological and cognitive development is most pronounced. Differences in development exist not only between individuals, but within individuals. Maturation in one area, argues Zabin (1990: 263), is not indicative of the level of maturation in another. Since the 1970s, youths have had to wait longer to move into adulthood. The average age of menarche among girls has declined by three to four months each decade over the last century, yet longer educational careers and a rising average age at marriage have increased the interval between physical maturation and acceptance as an 'adult' (Voydanoff and Donnelly, 1990: 23; Zabin and Hayward, 1993: 8-9, 29). People in their teen years are prevented from 'growing up' as quickly as past generations and, at the same time, they see that sex outside of marriage is gaining acceptance among adults.

Adolescent relationships are characterized primarily by instability, and teens commonly have trouble distinguishing "love" relationships from casual ones (Zabin and Hayward, 1993: 60). Difficulty in forming stable relationships exists because they do not yet have stable self-images. The relationships of early adolescence are not primarily sexual in motivation, but are an attempt to achieve identity (Zabin and Hayward, 1993: 60). While most teens believe that it is morally appropriate for sex to take place only within the context of a committed "boyfriend/girlfriend" relationship (Forste and Heaton, 1988: 250-1), their efforts to adhere to this standard conflict with the reality (i.e., instability) of teenage relationships.

Sexual Intercourse as a Choice

That teens have difficulty making sexual decisions is reflected by studies indicating that most adolescents do not make a conscious choice about becoming sexually active. The vast majority of sexually active teenagers did not foresee their first sexual experience. Rather, it is an event that 'just happened' (see, for example, Brooks-Gunn and Furstenberg, 1989: 251; Miller and Moore, 1990: 1026; Zabin, 1990: 267). Zelnik and Shah (1983: 69) report that only 17 percent of the young women and 25 percent of the young men in their study planned their first act of intercourse. The level of cognitive development characteristic of young adolescents may preclude their understanding that to have or not have sexual intercourse is actually a *choice* (Hayes, 1987: 101). According to Zabin and Hayward (1993: 63), the younger a teenager is at first coitus, the less likely he or she is to foresee the event. Lack of planning has obvious implications for the use of contraceptives. Teens who anticipate their first sexual encounter are far more likely to use contraception than those for whom intercourse is unplanned (Zelnik and Shah, 1983: 67). In their study of adolescent males, Ku et al. (1993: 693) report that age at first intercourse is positively related to the likelihood that contraceptives will be used.

Further evidence that most teenagers do not consciously choose to become sexually active is provided by authors who report that adolescents commonly believe that the appropriate age for becoming sexually active is older than the age at which they themselves first experienced intercourse (e.g., Howard, 1992: 183; Zabin and Hayward, 1993: 74). In her sample of sexually experienced teenagers, Zabin reports that 83 percent cited a 'best' age for first coitus that was older than the age at which they themselves

became active, 43 percent indicated an age that was older than their current age, and 25 percent said that premarital sex was wrong (Zabin and Hayward, 1993: 74). When asked why they had sex, Herold (1984: 19) reports that the most common reasons cited by teenage females are that the act was an expression of love for their partner, a desire to maintain the relationship (i.e., fear of breaking up), and curiosity. Herold does not provide reasons for males. Miller and Moore (1990: 1029) found that 73 percent of girls and 50 percent of boys identify social pressure as a reason why teenagers do not wait until they are older to have sex.

The Sexual Behaviour of Adolescents

According to Zabin and Hayward (1993: 29), first coitus is clearly a marker of “developmental importance.” Rates of initiation of intercourse have risen since the 1970s. A number of surveys reveal that teens are experiencing sexual onset at earlier ages and higher proportions of teens are reporting sexual activity (Voydanoff and Donnelly, 1990: 24; Zabin and Hayward, 1993: 11). The most recent, nationally representative study of teenage sexual behaviour in Canada was conducted in 1988 by the Social Program Evaluation Group of Queen’s University. Information was gathered about the sexual knowledge, attitudes and behaviour of 38,000 Canadians aged eleven through twenty-one, 9,860 of whom were in grade nine. Findings reveal that 31 percent of males and 21 percent of females in grade nine have had sexual intercourse at least once (King et al., 1988: 84). American data indicate that approximately half of all never-married females

between the ages of fifteen and nineteen have had intercourse (Zelnik and Shah, 1983: 65; Hayes, 1987: 15; Zabin and Hayward, 1993: 17). Males, however, tend to initiate coitus at an earlier age than do females. Zabin and Hayward (1993: 17) report that while approximately two out of every five males has had sex by age fifteen, the figure for females is one out of every four. Moreover, the mean age of first coitus among males is 15.7 years, while the comparable figure for females is 16.2 years (Zabin and Hayward, 1993: 17). This difference in reported behaviour begs the question of who the young males are having intercourse with. The figures give rise to the suggestion that there may be a tendency for young males to over report their behaviour and/or young, female adolescents to underreport sexual activity. These differences between the sexes tend to disappear by the end of adolescence. By age eighteen to nineteen years, claim Zabin and Hayward (1993: 17), 75 percent of females have become sexually active and so have 80 percent of males by the age of twenty. In this context, the term 'sexually active' is applied to those persons who have *ever* experienced heterosexual intercourse.

Having engaged in coitus once does not mean that the event will become a regular occurrence. Sexual intercourse among young teens is infrequent relative to relations between adults. Teenagers under the age of eighteen have intercourse, on average, only half as often as eighteen- to twenty-nine year-olds (Zabin and Hayward, 1993: 56). Intercourse among sexually experienced young people is generally sporadic in nature, writes Herold (1984: 16-7), and periods of sexual activity are often interspersed with long periods of abstinence. After first intercourse, one-third of adolescents do not have sex again within the next six months, claim Miller and Moore (1990: 1026). Sprinthall and

Collins (1995: 385) report that 20 percent of sexually experienced female teens have not had sex in the past three months. This is likely related to the unstable, episodic nature of teenage romantic relationships.

Factors Related to the Likelihood of Intercourse

Clearly, not everyone becomes sexually active during their early teen years. What factors are related to a greater likelihood of the onset of sexual intercourse?

Sexual Activity as a Risk Behaviour

There is considerable debate among researchers over whether sexual intercourse among adolescents should be considered a part of normal development or part of a cluster of risk-taking behaviours. The developmental view of sex among teenagers stresses the interaction of situational, social, interpersonal and maturational factors that are a common part of the lives of adolescents (Wodarski and Wodarski, 1995: 13). Others regard sexual activity during adolescence as almost pathological in nature, emphasizing links among sexual intercourse and deviant behaviours such as delinquency and the use of drugs. A higher percentage of sexually experienced Canadian grade nine students report smoking cigarettes, drinking alcohol, or using marijuana when compared to their non-experienced counterparts (King et al., 1988: 96-7). A longitudinal study conducted by Elliot and Morse (1989) indicates that there may be a typical temporal sequence of problem behaviour that begins with delinquency, followed by the use of drugs and then sexual intercourse. The risk of having intercourse appears to depend on one's delinquency and

drug status and is thought to reflect a general propensity to engage in risk-taking behaviour (Card, 1993: vii; Elliot and Morse, 1989: 56; Jessor et al., 1983: 623; Ku et al., 1993: 680; Miller and Moore, 1990: 1027). Sex differs from other high risk behaviours, however, because age is an integral part of the issue. The use of illegal drugs, for example, is generally considered inappropriate at any age, but sex is not always 'wrong' (Zabin, 1990: 247). Hayes (1987: 101) contends that the association between sexual activity and behaviours such as drinking or smoking reflects a push towards independence or a desire to become "grown up." Indeed, in Jessor et al.'s (1983: 623) prospective study of adolescent virgins, those who placed a higher value on and expectation for independence were more likely to subsequently engage in intercourse.

The Impact of Physical Development

Physical maturity also plays an important role in the initiation of sexual activity. Hormonal changes and a physiologically-based drive contribute to the desire for sex, and puberty is accompanied by changes in the way that individuals view themselves and are perceived by others. This, in turn, is thought to influence the selection of friends, which affects opportunities to engage in sexual behaviour (Zabin and Hayward, 1993: 28). Girls who mature physically at an earlier age, for example, tend to be granted more freedom by their parents and also tend to have older friends (Brooks-Gunn and Furstenberg, 1989: 251). Studies over the past thirty years have demonstrated that age at menarche is positively related to age at first intercourse among females (Zabin and Hayward, 1993: 33; Miller and Moore, 1990: 1026-7).

The Role of Family and Peers

Other factors related to teenage sexual activity involve family and peer influences.

Mothers in particular appear to be an important source of influence. Teens living with single mothers who date are more likely to be sexually active than those whose mothers do not date (Card, 1993: vii). According to Ku et al. (1993: 686) teenage males who do not live with their mothers are at a higher risk of intercourse than those living in households where the mother is present. Several authors report a curvilinear relationship between teens' perceptions of parental strictness and adolescents' sexual attitudes and behaviour. More permissive attitudes and higher levels of sexual activity are found among teens who view their parents as the least strict or the most strict when compared to those whose parents are perceived as moderately strict (Forste and Heaton, 1988: 253; Miller and Moore, 1990: 1028-9). The family relations of sexually active adolescents are generally less positive than those of abstinent teens, who report better communication and more affective relationships with their parents (Brooks-Gunn and Furstenberg, 1989: 251; Olson et al., 1984: 83-5). Teens who report that their attitudes towards sex resemble those of their parents are less likely to have premarital sex than teenagers who do not perceive this similarity (Voydanoff and Donnelly, 1990: 37). Card et al. (1992: 2) argue that parental views on sexual issues tend to be influential only under conditions where communication between parents and children is open.

In the absence of clear definitions of what is right and wrong, contends Herold (1984: 47), adolescents look to statistical norms rather than value norms to see if they are

“normal.” Teenagers are very interested in what others are doing, and while their perceptions of what peers are doing may not always be accurate, these perceptions are highly predictive of their own sexual experience (Brooks-Gunn and Furstenberg, 1989: 251; Card, 1993: vii; Card et al., 1992: 2; Miller and Moore, 1990: 1029; Voydanoff and Donnelly, 1990: 38; Wodarski and Wodarski, 1995: 8-9). It should be noted that the direction of causation, if any, is unclear with regard to the association between teens’ sexual activity and perceptions of friends’ behaviour. Billy and Udry (1985: 21) note that friends may influence one another, be selected because of initial similarity, or be dropped if dissimilarity occurs or is perceived. Social influences also derive from the interaction between peer and parent relationships. Teens are also more likely to engage in intercourse when they perceive lower compatibility between peers’ and parental views on social issues (Jessor et al., 1983: 623). Moreover, when teenagers report that friends have a greater influence over their sexual attitudes than do parents, the onset of intercourse is more likely (Jessor et al., 1983: 623; Voydanoff and Donnelly, 1990: 37).

The Role of Factors Related to Education

Educational variables are related to sexual experience. Years of parental education are negatively associated with the likelihood of the onset of intercourse, although this may be a function of socioeconomic status, which is also inversely related to sexual activity (Miller and Moore, 1990: 1028; Voydanoff and Donnelly, 1990: 28; Forste and Heaton, 1988: 252). High academic achievers and adolescents with high career goals are also less likely to be sexually experienced (Card, 1993: vii). In the Canadian study conducted by

King et al. (1988: 99), a lower proportion of grade eleven students who expect to attend university have ever had intercourse when compared to those who do not expect to continue their education beyond high school. Similar findings are reported by Miller and Moore (1990: 1027) and Jessor et al. (1983: 623). The direction of causation with respect to the relationship between school performance or academic goals and sexual behaviour is not completely clear. According to Brooks-Gunn and Furstenberg (1989: 254), the onset of teenage sexual behaviour is usually associated with a decline in school interest and/or achievement.

The Role of Factors Related to Religion

Religion plays a role in adolescent sexual behaviour. The highest levels of premarital sex are found among teenagers with no religious affiliation. Among those who do identify with a particular religion, the specific religion or denomination is insignificant (Forste and Heaton, 1988: 252). According to Hayes (1987: 100), Catholicism, once regarded as representative of conservatism on moral issues, is no longer an accurate predictor of sexual experience. It appears that religiosity rather than a specific religious affiliation is related to sexual activity. For example, King et al. (1988: 99) report that more than twice as many Canadian teens who are virgins attend church weekly when compared to sexually experienced youth. Similar findings are reported by Jessor et al. (1983: 623), Forste and Heaton (1988: 252), Hayes (1987: 99), Miller and Moore (1990: 1029), Voydanoff and Donnelly, 1990: 31-2, and Ku et al. (1993: 687).

The Value of Sexuality Education in Schools

The importance of education about sexuality becomes apparent when one considers the proportion of adolescents who are sexually active as well as some of the negative consequences of sexual activity among teens. The United Nations (1997: 371) reports that, in 1992, 326 Canadian females under the age of fifteen and 11,214 between the ages of fifteen and nineteen had abortions. Among all births that year, 263 were to females under the age of fifteen, and 23,985 were to those aged fifteen to nineteen (United Nations, 1997: 333). Of the 23,416 births to teenage mothers in Canada in 1995, over 20,000 of them were to unmarried women (Statistics Canada, 1997: 16). Although the fertility rate of 22.5 per 1000 women aged fifteen to nineteen in 1995 is much lower than the figure of 35.7 reported by Statistics Canada (1997: 13) for the year 1975, pregnancy among teens is still a problem. Concern with adolescent pregnancy generally stems from recognition of the association between early childbearing and poverty (Dryfoos, 1988: 194). Zabin and Hayward (1993: 13) remind us that, when comparing aggregate birth rates, one must keep in mind that such factors as sexual activity, the use of contraception, and recourse to abortion if pregnancy occurs all have implications for birth rates, and that these three factors do not necessarily change in the same direction. According to Hayes (1987: 15), for instance, a greater proportion of American adolescent females became pregnant in the 1980s compared to the 1970s, but rates of childbearing among teens decreased as a result of higher levels of abortion.

The problem of pregnancy among teens is complicated by the fact that pregnant adolescent females often fail to recognize or acknowledge their pregnancy promptly,

thereby limiting prenatal care or safe abortion. Zabin and Hayward (1993: 59) report that teenagers tend to have abortions at later stages of pregnancy than do adult women, thereby increasing the risk of complications.

In the past, public criticism of sex education in schools has been based largely on the notion that talking about sex may encourage teens to engage in behaviour that they had previously not even considered. Scientific studies do not support this contention. Sex education has been defined as “any instruction that includes some discussion of human sexual development, the process of reproduction or the exploration of interpersonal relationships and sexual behavior” (Forrest and Silverman, 1989: 65). While this rather imprecise description leaves much room for variation, there exists a general consensus among researchers that young people who receive some form of sex education at school are neither more nor less likely to become sexually active (Dawson, 1986: 169; Forste and Heaton, 1988: 252-3; Kirby et al., 1994: 352; Marsiglio and Mott, 1986: 151, 158; Rosoff, 1989: 52; Sprinthall and Collins, 1995: 395; Voydanoff and Donnelly, 1990: 96; Zelnik and Kim: 1982: 117-26):

Kirby et al. (1994: 341) believe that the school is an ideal setting for instruction in sexual matters because school is an institution attended by almost all young people before they become sexually active, and most teens are enrolled in school when they become active. Authors stress the importance of providing instruction in sexual matters before teens have had the opportunity to become sexually active (Wodarski and Wodarski, 1995: 18; Zabin and Hayward, 1993: 110). This is likely because it is generally believed that to encourage new behaviours or reinforce existing ones is easier than modifying existing

behaviours (Bilodeau et al., 1994: 180-1). When a program encouraging contraceptive use was implemented in two Montreal high schools, for example, Bilodeau et al. (1994) found that a higher proportion of students becoming sexually active after implementation used effective birth control relative to comparison group subjects becoming active during the same period. For those students already sexually experienced before intervention, no effects on contraceptive use were observed (Bilodeau et al., 1994: 180). Timely instruction is also necessary in order to reach individuals who are at the highest risk for sexually-related problems because, according to Zabin and Hayward (1993: 110), they tend to drop out of school or be absent frequently.

Sex education is also necessary to combat misinformation that teens may have received from peers. According to Wodarski and Wodarski (1995: 8), teens are more likely to initiate discussions about sexual matters with their peers than anyone else and often receive inaccurate information. When their information about sex comes primarily from peers, as opposed to school or parents, teenagers are more likely to experience sexual activity during adolescence (Gilgun and Gordon, 1983: 32). Forste and Heaton (1988: 253) find that the lowest prevalence of sexual activity is found among teens who receive sex education both at school and from parents at home. Early education before adolescents have begun to engage in sexual behaviour may help to combat these problems. Wodarski and Wodarski (1995: 18) argue that the middle school years are the best time to begin sexuality education and Zabin and Hayward (1993: 110) also recommend reaching students before grade nine or ten .

Evidence supporting the need for sex education also comes from parents. Most

parents support instruction about sexuality in schools. For example, Gilgun and Gordon (1983: 32) claim that, when given the opportunity to refuse permission for their children to receive sex education at school, only 1 to 3 percent of parents actually do so. Rosoff (1989: 52) notes that while most parents believe that they should be the primary source of values for their children, they often say that they have a limited ability to discuss sexuality with their sons and daughters. Discussions of sex between parents and their children are commonly viewed as awkward by both parties (Zabin and Hayward, 1993: 45) and parents are usually not a major source of knowledge about sex (Voydanoff and Donnelly, 1990: 36). Schools may, therefore, be important providers of information that teenagers do not receive at home.

Delaying Sexual Onset: Sex Education as Moral Education

The Developmental Context of Teenage Sexual Activity

The types of interventions aimed at preventing pregnancy among teens will depend on how the problem is conceptualized. Some view the problem as the result of a failure to use effective contraceptives, while others view it as the outcome of teenage sexual activity in general. Whether efforts to prevent teenage pregnancy involve the encouragement of contraceptive use or abstinence, programs must address the context in which adolescents' sexual decision-making occurs. Zabin and Hayward (1993: 57) report that adolescents are less likely than adults to use a method of contraception at first coitus, less likely to obtain a method after becoming sexually active, or, if they do acquire contraceptives, are less likely than adults to use them consistently.

Pregnancy among adolescents is commonly viewed as the result of an inability to plan ahead, a lack of ability to appreciate the personal risk of becoming a parent, or a lack of social skills needed to discuss birth control with partners. Gilgun and Gordon (1983: 28) believe these factors are typical of the developmental stages characteristic of early adolescence, when teens have difficulty appreciating the consequences of their actions, especially in emotionally-charged situations (Gilgun and Gordon, 1983: 28). Authors commonly claim that adolescents subscribe to a “personal fable” that they are somehow immune to pregnancy (see, for example, Zabin, 1990: 263-5; Zabin and Hayward, 1993: 60). The term is used to describe a belief constructed by the adolescent that he or she is unique and not subject to risks that peers may face. This egocentric stage of development is believed to occur in early adolescence (Zabin and Hayward, 1993: 60). Also, many teens, despite having had intercourse, fail to view themselves as sexually active persons, often because they are not having sex on a regular basis. Zabin (1990: 267) notes that stability of relationships is related to the use of contraceptives. Internalizing the notion that they are at risk of becoming pregnant or causing a pregnancy requires a level of abstract thinking that many young teenagers have not yet achieved (Zabin, 1990: 263-5). While the immediate cause of pregnancy may be lack of contraception, if intercourse could be delayed until people have matured to the point that these problems did not exist, many unintended pregnancies could be prevented. Dryfoos (1992: 241) refers to the encouragement of abstinence among teenagers as the “first line of defense” against pregnancy. It is here that value-based sex education appears to have a role.

The developmental age of adolescents at the time of sexual onset is important

because it affects the way in which their sexuality is managed. According to Zabin and Hayward (1993: 54), the younger persons are when they become active, the higher the likelihood that they will encounter negative physical, emotional and interpersonal consequences that arise from sexual activity (Zabin and Hayward, 1993: 54). This is due both to the increased length of exposure to the risk of problems and to younger adolescents being less likely to protect themselves or their partners from pregnancy and disease (Olson et al., 1984: 75). For example, Howard (1992: 182) reports that the earlier one initiates coitus, the greater the number of partners over one's lifetime, and thus, the greater the probability of contracting a sexually transmitted disease (Howard, 1992: 182). Furthermore, research findings indicate that sexually active teens are less likely than adults to receive prompt attention for sexually transmitted diseases and have higher rates of sexually transmitted diseases than any other age group (Zabin and Hayward, 1993: 58; Kirby et al., 1994: 340). Emotional consequences of sexual activity can include feelings of intense dissatisfaction, exploitation, and guilt (Kirby et al., 1994: 339). Because of the normal characteristics of teenagers and the influence these characteristics have on their sexuality, it is not the exceptional, but the typical teenager, who experiences problems when he or she becomes sexually active (Zabin and Hayward, 1993: 54).

Sexuality and Self Concept

Values must be integrated into sex education because, unlike many other subjects taught in school, sexuality is an important part of one's identity. When grappling with sexual issues, teens are faced with concerns about self-concept and self-esteem, as well as questions

about what it means to be a man or a woman (Zabin and Hayward, 1993: 29; Gilgun and Gordon, 1983: 28). Forste and Heaton (1988: 251) argue that teens who participate in intercourse are more likely to be hurt emotionally than those who do not. The psychological consequences of sexual involvement indicate that discussions of sex cannot be detached and objective, but must revolve around value-based questions. The emotional and interpersonal aspects of sexuality make sex not a purely physical, but also a moral subject.

The Limited Impact of Factual Knowledge

Further support for the integration of values into sex education is provided by a number of studies concluding that the provision of basic information about such things as pregnancy, contraception, and sexually transmitted diseases usually does not translate into behavioural changes. While information-based programs often produce improvements in knowledge, there is little evidence of impacts on behaviour (Barth et al., 1992: 54; Howard and McCabe, 1990: 21; Kirby et al., 1991: 253; Miller and Paikoff, 1992: 265-6). In their meta-analysis of 134 studies of adolescent contraceptive use, Whitley and Schofield (1986: 187) report that knowledge of sex and contraception have a mean correlation with contraceptive use of only .17 ($p > .001$) for both males and females. Maticka-Tyndale (1991: 46-7) reports that adolescents' knowledge about AIDS and the transmission of HIV is generally accurate, but their understanding is not translated into effective measures of risk reduction. The subjects in her study continued to engage in sex with multiple partners, and they had a tendency to use condoms only at the beginning of a relationship

and discontinued use as the relationship progressed. Despite increased awareness of AIDS over the past several years, the use of condoms is inconsistent among teens and there has been no increase in the proportions of teenagers remaining abstinent (Maticka-Tyndale, 1991: 46-7).

According to Wodarski and Wodarski (1995: 17), this is likely because educators have failed to sufficiently appreciate that cognitive and moral processes mediate the *use* of information. After the completion of a program aimed at increasing the use of contraceptives in two Montreal high schools, students exposed to the intervention who became sexually active after implementation were more likely to use birth control than comparison group members who initiated coitus during the same period of time. However, the program resulted in no significant differences between the members of the treatment and comparison groups with regard to knowledge of contraceptives (Bilodeau et al., 1994: 178). Factors other than simply knowledge about contraception were obviously at work in this case.

Delaying Sexual Onset

It is because of the negative consequences of intercourse that many consider adolescent sexual activity to be a problem regardless of whether or not pregnancy occurs (Hayes, 1987: 16). According to Howard (1992: 181), interventions designed to delay intercourse are relatively new in the field of adolescent reproductive health. Traditionally, sex education has taken place within a context of moral relativism. Instruction in schools has generally focussed on anatomy and physiology and conventionally, information has been

delivered in a non-judgemental way, emphasizing that the appropriate time to begin having intercourse is "when it's right for you" (Howard, 1992: 191). Kirby et al. (1991: 253) claim that these programs are based on the belief that if teens are provided with sufficient information about sexual matters, they will choose to avoid risky behaviours. Counselling and guidance, contends Howard (1992: 183), have generally been offered only to those teens who are sexually active, while the non-active or virgin students are largely ignored and left on their own to cope with pressures to become sexually involved. With conventional approaches to sex education, "youth who remained abstinent were not even told by adults that they were 'doing a good job'" (Howard, 1992: 183). While this approach may have been appropriate in the 1970s, when abstinence was the norm (Howard, 1992: 181), it is inadequate today. If educators want to delay intercourse, something more value-based is needed (Howard, 1992: 191). Wodarski and Wodarski (1995: 18) assert that while teenagers may not always agree with the values embodied in a program, these values should be clearly stated so that students can make their decisions against a known standard .

Previous Approaches to Sex Education

Over four thousand American sex education teachers were surveyed by Forrest and Silverman (1989) in order to gain an understanding of what issues were important to them. Respondents were asked to list the three messages they believed were most important to convey to students. The most common messages cited by teachers were,

"exercising responsibility regarding sexual relationships and parenthood," "knowing the importance of abstinence and how to resist pressures to become sexually active," and "having information about AIDS and STDs." The authors report that only 25 percent of the educators listed information about contraceptives among their top three messages (Forrest and Silverman, 1989: 67).

A number of sex education programs have been developed in response to what are perceived as high rates of sexual involvement and pregnancy among teenagers. These programs vary widely in terms of content and the ways they address the concerns of teachers and parents.

Some interventions emphasize the use of contraceptives and/or condoms; the message is to never have sexual intercourse without protection. Many of these programs also include components that encourage young people to abstain from intercourse. While some educators worry that information about contraceptives may encourage promiscuity, Zabin and Hayward (1993: 101) contend that their concerns are ill-founded. It is difficult to support such arguments, they say, when one considers that the median time of delay between the initiation of intercourse and the acquisition of a regular method of birth control is one year. Interventions involving reproductive health provide, in addition to information about pregnancy and contraception, services such as pregnancy testing, treatment for sexually transmitted diseases, distribution of condoms and other contraceptives and counselling (Zabin and Hayward, 1993: 92).

Other programs attempt to provide teenagers with alternatives to sexual activity by raising their aspirations for the future. Such programs are based on the idea that teens

need not only the capacity but also the desire to avoid pregnancy. Such motivation is thought to be raised by enhancing their perception of life opportunities. Adolescents must believe that avoiding parenthood will enhance their life chances. Interventions of this type are often referred to as embodying a "life options" approach (Dryfoos, 1984: 194).

Efforts to promote abstinence are divided into two types. Some say that the emphasis should be on abstinence until marriage, while others argue that any delay is beneficial and attempt to convince students to wait without specifying how long (Miller and Paikoff, 1992: 266-7). Another issue being debated by educators favouring an abstinence-based approach is whether or not to provide students with information about contraceptives. Those who disagree with the provision of information about contraceptives frequently argue that this would constitute a "mixed message," that would confuse students. On the other hand, many believe that teenagers have a right to know how to protect themselves if they do become sexually active (Howard, 1992: 191). Dryfoos (1992: 254), who supports the promotion of abstinence, claims that "high priority" must still be allotted to education about contraceptives, otherwise individuals at high risk for pregnancy will not be adequately served. Kirby et al. (1994: 346) report that most abstinence programs either do not discuss birth control or they point out the failure of contraception to fully protect against pregnancy and STDs. While three-quarters of the teachers surveyed by Forrest and Silverman (1989: 67) said that students should be encouraged not to have sex, almost all of the respondents agreed that they should be taught how to protect themselves from pregnancy and sexually transmitted diseases in the

event that they do have sex in the future.

Each of the types of interventions described above have been implemented over the past ten years and they have had varying degrees of success. Here, the discussion will focus on programs designed to delay the onset of intercourse, interventions aimed at increasing the use of contraceptives, and the provision of reproductive health services. Unfortunately, research documenting the extent to which the 'life options' approach has been successful could not be found. This problem was also noted by Hayes (1987: 6-7) some years ago.

Programs Designed to Encourage Contraceptive Use

Programs designed to encourage contraceptive use are often based on the health belief model. According to Eisen and Zellman (1987: 528), this approach is based on the assumption that health related behaviours such as alcohol use and sexual intercourse are influenced by perceptions of susceptibility to a condition, perceived seriousness of the condition, perceived barriers to engaging in preventive behaviour and the perceived benefits of engaging in the preventive behaviour. Many of these programs aim to encourage abstinence, but also have the goal of increasing the use of contraceptives among those students who are or become sexually active.

"Sexprimer pour une sexualité responsable"

An example of a program based on the health belief model is "Sexprimer pour une sexualité responsable" which was implemented in two Montreal high schools where rates

of pregnancy were at double the provincial average. Students in grades nine and ten were the target of the program. The following components were included: education on sexuality, contraception, interpersonal relationships and communication; family communication through newsletters informing parents of the program activities and suggestions for initiating conversations about sexuality with their sons and daughters; and a clinical component where physicians and nurses visited classrooms to inform students of services that are available. Researchers employed a quasi-experimental design and involved 732 students. 355 were in the program group and 377 were in the comparison group. The results revealed no significant differences in knowledge of contraceptives (Bilodeau et al., 1994: 179). However, knowledge about and use of clinic resources increased more in the program group than in the comparison group. Increased frequency and greater ease of communication about sexual matters was reported by parents whose children received the intervention. This effect was still noted four months after the completion of the intervention (Bilodeau et al., 1994: 180).

An intervention based on the health belief model

A program implemented in Texas and California schools was based on a combination of the principles of the health belief model and social learning theory. It was hypothesized that allowing students to observe examples of both appropriate and inappropriate behaviours and participating in role-playing would be effective in promoting both abstinence and the use of contraceptives. Factual information about reproductive physiology and anatomy, the health risks of sex, myths about contraception and methods

of birth control (including abstinence) was presented. Group discussion of this factual information took place (Eisen et al., 1985: 188-9). An effort was made to impart to students the skills necessary to improve communication between sexual partners. Films were shown that portrayed teens in sexual decision-making scenarios and role-playing sessions were held to demonstrate both the susceptibility to and consequences of pregnancy. Role-playing sessions often required students to engage in reversals of gender roles (Eisen et al, 1990: 262). The fifteen hour curriculum was delivered in six sessions (Eisen and Zellman, 1987: 528). This new intervention was compared with the usual classroom curriculum and data were collected before intervention, immediately after intervention, and twelve months after completion of the program. The analysis was conducted separately for each of the following four groups: males who reported having intercourse at baseline; males who were virgins at baseline; females who had experienced intercourse at baseline; and females who had not had intercourse at baseline.

The teenagers involved in this study were mainly from low socioeconomic backgrounds, and ranged in age from thirteen to nineteen (Eisen et al., 1990: 269-70). Among those males who had not engaged in intercourse at the pretest, those receiving the program were significantly more likely to remain abstinent than their counterparts in the comparison group both immediately after the intervention and at the one-year follow-up. The program had no impact, however, on the maintenance of abstinence among female students (Eisen et al., 1990: 266). Overall, the program did not have a significant impact on the use of contraceptives for either males or females. It is interesting to note, however, the relationship between knowledge and behaviour that was observed in this study. Eisen

et al. (1990: 268) report that, among females who had not had intercourse at baseline, their post-test knowledge of sexuality (including reproduction and contraceptives) was associated with more efficient contraceptive use, and for their male counterparts, this knowledge was associated with continued abstinence. This finding illustrates the importance of reaching teens before they become sexually active.

"Reducing the Risk"

"Reducing the Risk" is a program that attempts to encourage teens to avoid risky sexual behaviour, either by using contraceptives and condoms or abstaining from intercourse. The program is based on three main theories, including the health belief model described above. Secondly, social inoculation theory suggests that people develop resistance to social pressure when they are able to recognize its various forms and are given opportunities to practice resistance to weak forms of that pressure. Cognitive behaviour theory holds that specific cognitive and social skills are needed for successful negotiation in relationships. According to Barth et al. (1992: 55), discussions of social pressures, training in communication skills and opportunities to practice these skills through role-playing are an important part of the program. Classroom discussions and program activities consistently reinforce the norm that students should not have unprotected sex (either by abstaining or using contraceptives). Students are also asked to talk with their parents to ask their views on abstinence and birth control (Kirby et al., 1991: 255).

In a quasi-experimental design, forty-six classrooms from thirteen high schools across ten school districts in California were assigned to either a treatment or comparison

condition (Barth et al., 1992: 57). All classrooms had a regular health education program; "Reducing the Risk" was simply added to the treatment classrooms' usual curriculum. Post-tests were conducted six months and eighteen months after completion of the program. Questionnaires across all waves of the study were linked so that individual-level changes could be measured (Barth et al., 1992: 57). Comparison group members believed more of their peers were having sex than at pretest. Kirby et al. (1991: 259) claim that difference in change scores reveal that the program was effective in dispelling myths about the prevalence of sexual activity. According to Barth et al. (1992: 73-4), at both the six month and the eighteen month post-test, students in the program group exhibited a greater increase than comparison students in the proportion discussing abstinence and birth control with their parents. No significant advances were made in the intention to avoid unprotected sex as well as no significant improvement in the use of contraceptives among those students who were sexually active at the pretest. Students who initiated sexual intercourse after the intervention began reported more consistent use of contraception than those in the comparison group (Barth et al., 1992: 70-2). Among those who were not sexually active at pretest, program students were less likely to initiate intercourse than comparison group members. This effect was not observed, however, until the eighteen month post-test. The delay occurred largely because several months are needed for enough comparison group students to begin having sex that a difference would become apparent (Barth et al., 1992: 69-70). Based on these findings, the authors speculate that it may be easier to delay the onset of intercourse than it is to increase the use of contraceptives (Kirby et al., 1991: 262).

Providing Reproductive Health Services

Other sex education programs combine instruction with reproductive health services. Such a program was designed and administered by staff at The Johns Hopkins School of Medicine's Department of Paediatrics and the Department of Gynaecology and Obstetrics during the early 1980s. The program targeted adolescents attending schools in urban Baltimore. The outcome objective of the intervention was to reduce the incidence of unprotected sex. The rationale behind this program was that an educational component was not sufficient to make students seek out contraceptive services. Rather, Zabin (1992: 157) argues that the services must be readily available and accessible. It was believed that by linking the school with a birth control clinic, discussions related to sexual matters and pregnancy could be legitimized, thereby making students feel more comfortable discussing such matters with adults and using clinic resources (Zabin et al., 1986a: 183-4). Efforts were not intended to produce a decrease in sexual activity. Because such a high percentage of the students became sexually active at a relatively young age in this community, it was thought to be unrealistic to expect abstinence from most students. For example, Zabin et al. (1986b: 119) claim that 92 percent of grade nine males and 54 percent of grade nine females reported being sexually active before the intervention began. Two schools (one senior high and one junior high school) were selected for the program. The socioeconomic status of community residents was low (Zabin et al., 1986b: 119). Attempts were made to increase the use of contraceptives and reduce the rate of pregnancy by conducting classroom presentations on reproductive matters, offering counselling sessions in the school, and providing students with access to a birth control

clinic located very near to the school (where counselling, medical services and contraceptives were available). The program was taught to students in every grade over a period of three years.

After two or more years of exposure to the program, students exhibited significant increases in their knowledge of contraceptives and reproduction. Such increases were not observed among students in the comparison group (Zabin et al., 1986b: 121). Overall, the proportion of students attending birth control clinics increased after exposure to the program. Moreover, students attended clinics sooner after becoming sexually active than they did before the intervention. In comparison schools, no significant changes occurred (Zabin et al., 1986b: 122). Increases in the proportion of students using a contraceptive method at last intercourse were also achieved for both male and female students after two years of exposure to the program. In non-program schools, there was no significant difference over time for either males or females (Zabin et al., 1986b: 122-23). This finding applies both to students who were already sexually active at baseline and to those initiating intercourse after implementation (Zabin, 1992: 181). Changes in rates of pregnancy are analysed in terms of cumulative percentages. Thus, some increase over time is expected. To determine how much change has occurred, the rate of increase in the pre-intervention period is compared to that in the post-intervention period. Among females at the program school, the increase is significantly less after implementation than it is before, while the rate among females who did not receive the program actually increased (Zabin et al., 1986b: 123). Finally, Zabin et al. (1986b: 122) report that students exposed to the program for three years have a median age at first sexual intercourse that is seven months

higher than that of program school students who became sexually active during the period three years before the baseline survey (1986b: 122). While this finding may indicate that the program did not encourage sexual activity, caution must be exercised in its interpretation, as figures for comparison schools are not reported. The overall conclusion reached is that the Baltimore program had a significant impact, as it was successful both in increasing behaviours that reduce the risk of pregnancy and in reducing actual rates of pregnancy (Zabin et al., 1986b: 125).

Kirby et al. (1994) studied six sites where reproductive health services were linked with a school program. They suggest that, with regard to the use of clinic resources, a "substitution effect" may be occurring. Those who visit or obtain contraceptives from the clinic may have gone elsewhere had the clinic not been available. The evidence underlying their argument comes from the finding that the largest effects on contraceptive use or clinic visits were observed at schools with the strongest educational components. Thus, a strong educational component may be more important than reproductive health services (Kirby et al., 1994: 356).

Programs Designed to Encourage Abstinence

"Postponing Sexual Involvement"

In 1983, a hospital in Atlanta began a program called "Postponing Sexual Involvement" for eighth grade students. Its aim was to help teens resist peer pressure to initiate sexual activity. Among the assumptions underlying the program is the belief that teenagers engage in sex and other risky behaviours such as smoking and drinking, because they are

not completely aware of the harmful effects of these activities (Howard and McCabe, 1990: 21). Further, it is believed that young people engage in sexual behaviour due to both general societal pressure and peer influence (Howard and McCabe, 1990: 22). The intervention developed exposes students to some of these pressures while helping them to identify sources of these pressures, examine them critically, and deal with them in a responsible manner. The focus is more on the reasons why teens have sex and how to avoid it than on the consequences of sex. The program is led by older teenagers in grades eleven and twelve who act as role models. Ten sessions are held over the course of the school year in addition to the regular sex education program, which provides information about reproduction and family planning (Howard and McCabe, 1990: 22). The decision to use teenage mentors is based on the belief that messages about sex are more powerful when they come from people close in age to the participants. According to Howard (1992: 183), it also shows young teens that they can be successful without having sex and dispels myths that everyone is “doing it.” The teens leading the program conduct discussions, teach assertiveness skills and help participants to practice handling problematic situations.

The results of this program are impressive. Among students who were sexually inexperienced prior to implementation (approximately 75 percent of all students), those attending the program school were five times less likely to initiate intercourse by the end of grade eight than those at the comparison school. Although the effect was significant for both boys and girls, the impact was especially positive for female students. Howard and McCabe (1990: 23) report that boys in the program who were inexperienced at

baseline were three times more likely than controls to remain abstinent until the end of grade eight; girls in the program were fifteen times more likely to remain abstinent. Differences in the proportion of students becoming sexually active persist when measured again at the end of grade nine (Howard and McCabe, 1990: 25). At the end of grade twelve, differences between the program and comparison groups are no longer statistically significant (Howard, 1992: 187). Howard (1992: 187) claims that these differences are not due to a lack of opportunity for sex or lack of a boyfriend or girlfriend, as these factors were similar for both the experimental and comparison group. The program was not effective in getting those who had already had sex to become abstinent (Howard and McCabe, 1990: 24). The results are especially encouraging, argue Howard and McCabe (1990: 25), when one considers that the students involved were from low income backgrounds and were therefore considered to be at high risk for early sexual involvement. Finally, the authors conclude that giving contraceptive education alongside messages encouraging abstinence is not too confusing for students. Not only were program members less likely to begin having sex, but program students were more likely than comparison group members to use contraceptives when they did engage in intercourse, despite the fact that the contraceptive education provided was part of the regular sex education program taught in both schools (Howard and McCabe, 1990: 25).

By the late 1990s, "Postponing Sexual Involvement" was widely implemented in the middle-school curriculum in the United States. Kirby et al. (1997) surveyed 10,600 students in California before implementation, three months after completion of the program, and again seventeen months later. Their results are not as encouraging as those

reported by Howard, who designed the program. At neither three nor seventeen months are there any positive effects on sexual behaviour; treatment and comparison group members are equally likely or unlikely to initiate sexual activity. There are also no differences in the reporting of pregnancies or STDs (Kirby et al., 1997: 108).

Implementation of the program in this case differs in an important way from what was envisioned by the program developer in that most of the people leading the program were adults rather than teen mentors (Kirby et al., 1997: 100).

“Project Taking Charge”

“Project Taking Charge” offered thirty sessions to grade seven students in low-income schools in Missouri and Delaware. Sessions were integrated into a home economics class. There were also three evening sessions that parents could attend with or without their children. Topics included self-development, anatomy and physiology, pregnancy, STDs, vocational goal setting and family values. The design of the study was an experiment in which classrooms were randomly assigned to either a treatment or a control condition. In this case, controls received no sex education at all (Kirby et al., 1994: 346-7). The post-test was conducted six months after the intervention was completed. No significant difference in the proportion of students initiating intercourse was observed (Kirby et al., 1994: 346-7).

“The Adolescent Family Life Program”

Other abstinence programs place the family at the focus of prevention. The Adolescent

Family Life Program, for example, attempts to promote family involvement in sexuality education. Discussions emphasize the ways in which sexuality is linked with past, present and future family relationships. Attempts are made to show the intergenerational consequences of sexual decision-making, and homework assignments require students to discuss values and beliefs with parents. Parents are frequently invited to attend meetings, and they can bring their teenage sons and daughters with them if they wish to do so (Olson et al., 1984: 87). According to Olson et al. (1984: 88-9), the program has been shown to have positive effects on students' attitudes toward premarital sex (students developed attitudes that were less permissive than those of their counterparts in the comparison group) as well as increased parent-student discussion of sexual values and beliefs. The authors do not report whether these attitudinal changes translated into behavioural differences between treatment and comparison groups. Voydanoff and Donnelly (1990: 98) claim that family communication programs generally show short-term increases in family discussions about sexual issues, but there is no evidence of long-term effects related to sexual activity or pregnancy.

“Success Express”

Christopher and Roosa (1990: 68) reveal that a “sizable” proportion of the sample used by Olson et al. (1984) was affiliated with the Mormon Church, and that respondents' attitudes might therefore not be representative of those held by most teens. Also, long term effects were not investigated (1990: 68). Christopher and Roosa's program, called “Success Express,” targets middle-school students. Five sessions are taught once each

week for five weeks in order to teach behaviours, attitudes and skills that are related to abstinence. Topics include family values, self-esteem, the messages that teens receive from their environments, communication strategies, how to say “no” assertively, and an examination of future life goals (Christopher and Roosa, 1990: 68). Students targeted were low income, primarily minority group members, who, according to Christopher and Roosa (1990: 69), are more likely to become sexually active at a young age compared to middle-class whites.

Measures were obtained from 320 students in grades six and seven before implementation and one week after the program was completed. Increases in non-coital behaviours such as sexual touching were observed among program males relative to comparison group members and there were no differences in coital activity. No significant behavioural effects occurred among females (Christopher and Roosa, 1990: 69). When the analysis is conducted using only those students who were virgins at the pretest, the results are identical to those generated when the entire sample is used (Christopher and Roosa, 1990: 70).

Similar results are reported in a replication of this quasi-experimental study with 528 students. Here, authors report not only that there were no positive changes in sexual behaviour, but also no changes in attitudes favouring abstinence (Roosa and Christopher, 1990: 365-6). The authors say these results raise concerns about programs that focus exclusively on abstinence (Christopher and Roosa, 1990: 71). However, the extremely short post-test period (one week), when combined with the brevity of the program, poses serious limitations.

The “McMaster Teen Program”

In the early 1980s, health care providers at McMaster University in Hamilton, Ontario developed the McMaster Teen Program in response to the high rate of teen pregnancy. In 1981, the rate of pregnancy per thousand females aged fifteen to nineteen years was 59.7 in Hamilton, compared with a provincial average of 48.5 (Thomas et al., 1992: 30). The program was implemented in grade seven and eight classes. Ten sessions of one hour each were conducted over a period of six to eight weeks. Small, mixed-sex groups of six to eight students were led by trained tutors. Topics discussed included normal adolescent development, peer pressure, gender roles, responsibility in relationships, teenage pregnancy and childbearing, and stages of physical intimacy. According to Thomas et al. (1992: 31), contraceptive education was not included because it was not within the Ontario Ministry of Education guidelines for these grades at that time. An impact assessment of this program was conducted using a longitudinal, randomized design (Thomas et al., 1992: 30). To prevent contamination, the researchers claim, the unit of randomization was schools rather than classrooms or individual students (Thomas et al., 1992: 35). Comparison schools received the regular sex education program offered in health class, where students were segregated by sex and the focus was on the physical aspects of sexual development (Thomas et al., 1992: 35). The researchers report that, after four years, the program has no impact on rates of sexual initiation and there is no significant increase in the consistent use of birth control. Strengths of the study include a large number of subjects (there were 2,062 subjects in the experimental group and 1,228 in the comparison group). Moreover, there were almost no drop-outs from the program

(Thomas et al., 1992: 47).

Summary of Programs

Two main conclusions can be drawn from an examination of the programs presented above. First, there is no evidence suggesting that programs designed to promote the use of contraceptives and those aimed at encouraging abstinence differ in terms of success. It does appear, however, that different programs are viewed as being suited to different audiences. Interventions aimed at increasing the use of contraceptives have been targeted at groups of adolescents who demonstrate high levels of sexual activity and/or pregnancy, while the promotion of abstinence has been used for groups where most teens have not engaged in intercourse.

Second, prior sexual experience is an important factor affecting the success of various programs. Whether the goal is abstinence or contraception, interventions seem to have a greater impact on the behaviour of teens who have not engaged in intercourse prior to implementation.

Factors Related to the Success of Programs

In their comparison of various programs aimed at preventing teenage pregnancy, Miller and Paikoff (1992) and Kirby et al. (1994), derive several recommendations from interventions that have been successful in meeting their respective objectives. First, the target population should be relatively young. On average, adolescents begin having sex in their mid-teens. This is important to keep in mind, especially if the goal of a program is to

delay intercourse. This point is also emphasized by Zabin and Hayward (1993: 100).

Pregnancy prevention programs are most effective with sexually inexperienced students, especially with regard to behavioural changes (Miller and Paikoff, 1992: 270; Zabin and Hayward, 1993: 91). The timing of the messages being delivered is important. Mauldon and Luker (1996: 21-3) contend that prior exposure to contraceptive education, for example, is associated with an increased likelihood of contraceptive use at first coitus for young women, and this effect is especially marked if the education is received in the same year that they become sexually active.

The use of social learning theory as a basis for program development is recommended. The practice of abstinence, for example, will be affected by students' understanding of what must be done to avoid sex, a belief in the anticipated benefit of not having sex, a belief that the skills taught to avoid sex will be effective and the confidence that one is capable of using these skills. Kirby et al. (1994: 353) assert that teens acquire these beliefs directly through education and indirectly by observing the behaviour of others. Modelling the effective use of communication and negotiation skills, and providing students with opportunities to practice these skills is important (Kirby et al., 1994: 355). Effective programs must also address societal pressures by helping teens to recognize and overcome them (Kirby et al., 1994: 353). Providing information on rates of certain behaviours to stress that "not everyone is doing it" may be useful (Kirby et al., 1994: 355).

It is necessary, claim Kirby et al. (1994: 354), to provide basic facts about reproduction, the risks of unprotected intercourse, and information on how to avoid those

risks. Educators must be careful, however, to ensure that this information is not "unnecessarily detailed or comprehensive" (Kirby et al., 1994: 354). Moreover, according to Kirby et al. (1994: 354), the best way to teach this information is not through didactic instruction, but through experiential learning that is designed to personalize the information presented. Small group discussions may be helpful in this area (Kirby et al., 1994: 354).

Programs should be "intensive." The number of contacts made and their duration over time are important factors influencing the effectiveness of programs. Miller and Paikoff recommend that sessions be held at least once each week over an entire school year. They also assert that the program should be "comprehensive" by including at least two of the following components: values, knowledge, decision-making and social skills, reproductive health services, and options or alternatives that increase motivation to avoid pregnancy (Miller and Paikoff, 1992: 270). At the same time, however, the program should not be too broad in terms of its outcome objectives. Kirby et al. (1994: 353) argue that a narrow focus that emphasizes a few behavioural goals such as delaying intercourse or using protection is more effective than a program that spends a lot of time addressing additional issues such as gender roles or dating (Kirby et al., 1994: 353).

Finally, Kirby et al. (1994) stress the importance of continual reinforcement of clear values or norms. Program activities and discussions should focus on these values. These values should be appropriate for the audience targeted. Telling older teens to delay intercourse, for example, will probably have less meaning for them because so many will already have had sex. This is a more appropriate message for those in early adolescence

(Kirby et al., 1994: 354). There is little evidence about the relative importance of each of the characteristics listed above, but the message emphasized is that knowledge alone is insufficient to change behaviour.

The S.T.A.R. Program: Sexuality Teaching in the context of Adult Responsibility

Background

The S.T.A.R. (Sexuality Teaching in the context of Adult Responsibility) program was developed in the early 1980s in response to the perceived failure of other programs to either promote the effective use of contraceptives or encourage young people to delay intercourse. Adolescence is a period where young people are in a process of establishing their identities. In order to accomplish this task, they must distance themselves from parental values and norms in order to learn which values are truly their own and which are simply passively learned from a parent. Klaus argues that simply telling teenagers not to have sex does not work (Klaus and Kardatzke, 1990: 37). Hanna Klaus, designer of the program, claims that teenagers need to be taught how to integrate their biological capacity for reproduction into their “operational self-concept” (Klaus and Kardatzke, 1990: 35; Klaus, 1992: 1). In other words, they need to understand their sexuality and make it a part of their identity, something that Klaus and Kardatzke (1990: 37) refer to as “owning” one’s fertility. The process of coming to “own” one’s fertility is thought to be best achieved through experiential rather than simply didactic learning. Female students, for example, are taught to recognize their fertility patterns by observing and understanding

mucous changes as outlined in the Billings ovulation method. This experiential form of learning helps young women to internalize the psychophysiological complexity of their biological capacity to reproduce. Klaus and Kardatzke (1990: 38) take the position that this awareness directs attitudes and behavioural decisions by instilling in the young women a sense of respect for their sexuality.

As previously mentioned, current debates among educators who promote abstinence for teens focus on two central questions: Should family planning or contraceptive information be provided, and is the goal to delay intercourse until marriage or just until the teens are “older”? (Howard, 1992: 191). The S.T.A.R. program was developed from a Roman Catholic perspective, and thus includes elements that are consistent with the teachings of the Catholic Church. Information about contraception emphasizes the failure of “artificial contraception” to provide complete protection against pregnancy and sexually transmitted disease. Moreover, the ways in which the use of contraception isolates sexual intercourse from its main purpose (procreation and fulfilment of the union of marriage) are also stressed. The goal of the program is to reduce harm that results from premarital sexual intercourse and the primary objective is to delay the onset of sexual activity.

Sets of program activities or components may be categorized into the three major groups identified by Wilson and Kirby (1984: 11). These are information, skill-building (including such things as communication and decision-making), and an “affective” component where students are encouraged to explore and clarify their own values and attitudes. In order to allow students to feel more relaxed and comfortable, as well as

allowing teachers to tailor the program to the specific needs of each sex, classes are segregated by sex during the first half of the course, which focuses on reproductive physiology. Males and females are then brought together when relational aspects of sexuality are discussed.

Information about the anatomy and physiology of the male and female reproductive systems is provided, with a more detailed emphasis on the system of females. Teachers are also required to present information about adolescent social development and the characteristics that distinguish short-term and infatuation-based relationships from long-term, love-based ones, especially as they relate to marriage. The teachings of the Catholic Church with regard to sexual issues such as premarital intercourse, contraception, homosexuality and masturbation are also presented. This type of instruction may be considered the didactic or information component.

There is a large experiential aspect to this program, which includes both skill-building and the affective activities described above. Female students are encouraged to keep track of changes in their cervical mucous as well as their emotions on a daily basis in order to understand the ways in which these events covary. Males are required to conduct daily charting of their emotions. Assertiveness training is conducted through role-playing and class presentations, and discussions are held that encourage students to examine types and sources of pressure to become sexually active. In addition, classes of males are involved in discussions of sexual values and attitudes toward women. Finally, counselling sessions are offered for all students on an individual basis.

Parental permission is required before students can participate in the program. In

order to keep parents informed of the program's objectives and classroom activities, Klaus recommends that teachers hold three meetings for parents. One should be scheduled before the first S.T.A.R. session, the second should occur midway through the course and the final meeting should take place near the end of the program.

The S.T.A.R. program components, their implementation objectives and corresponding intended outcomes, can best be summarized using the program logic model framework devised by Rush and Ogborne (1990). Because of the differences in the program for females and males, the models are presented separately for each group in Figure 1.1 and Figure 1.2, respectively.

Figure 1.1 THE S.T.A.R. TEEN SEXUALITY PROGRAM FOR FEMALE STUDENTS

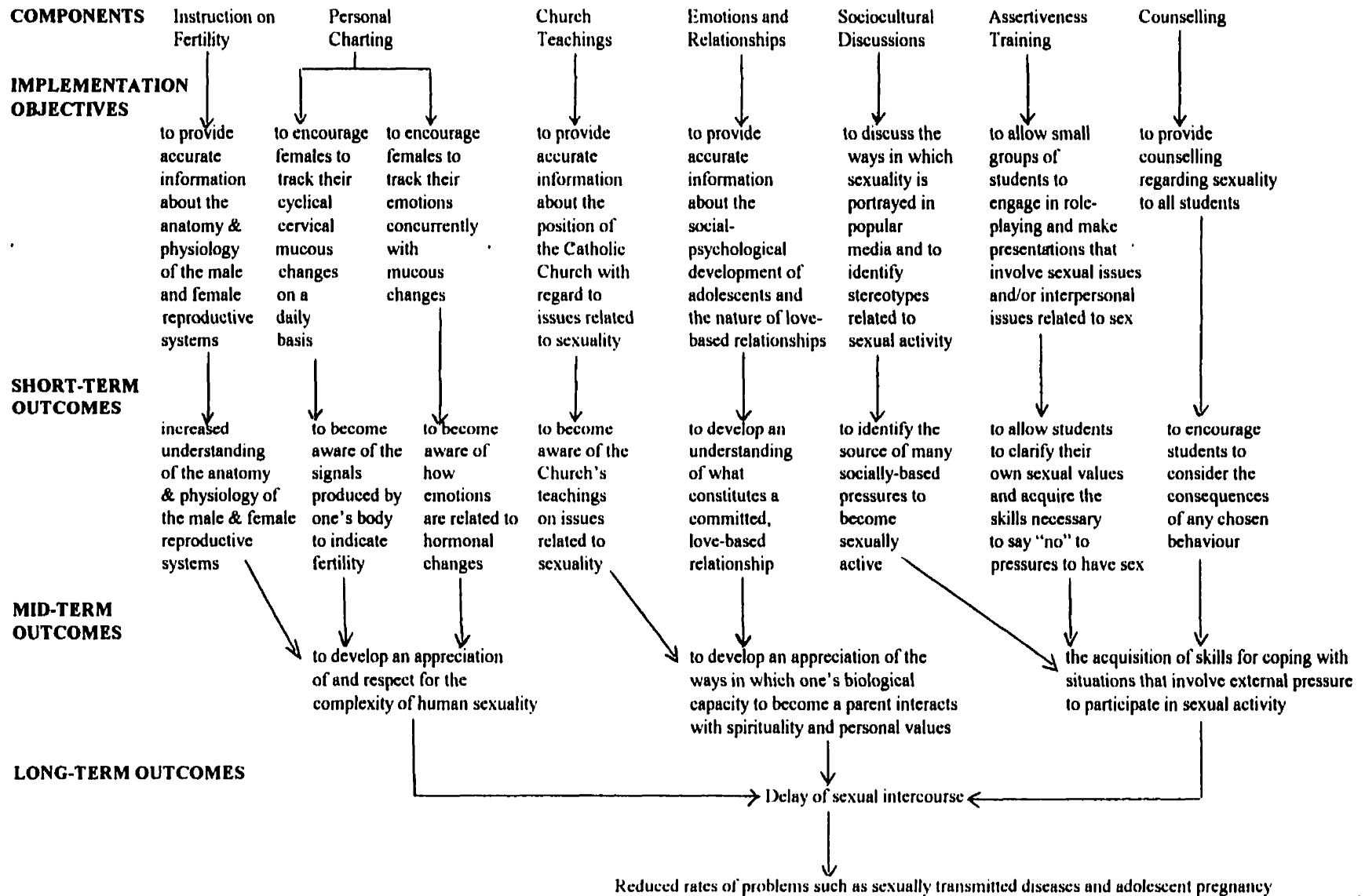
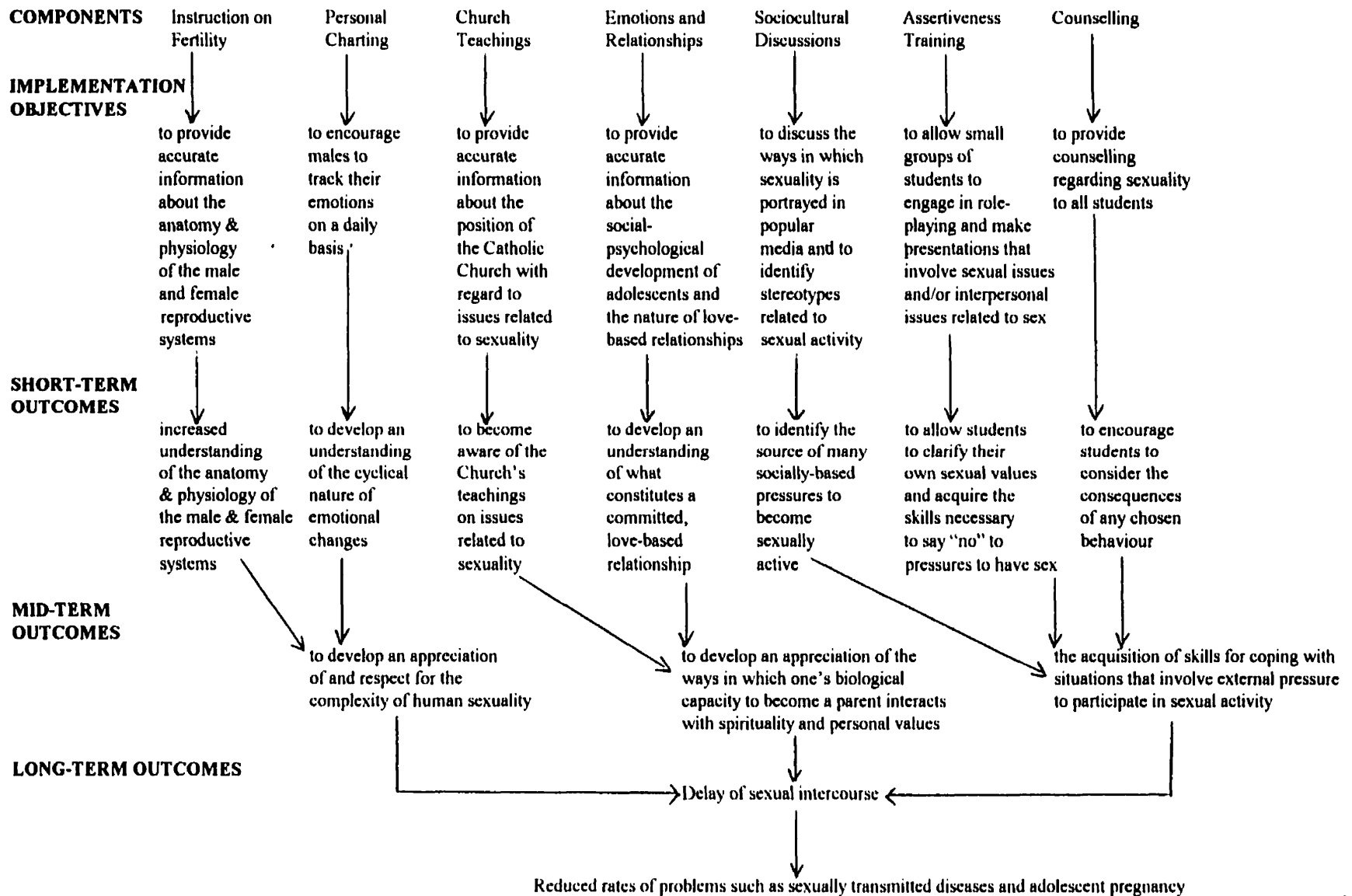


Figure 1.2 THE S.T.A.R. TEEN SEXUALITY PROGRAM FOR MALE STUDENTS



The Success of the S.T.A.R. Program

To date, there has been only one evaluation of the S.T.A.R. program. In her study, Klaus observed 899 females and 308 males who participated in the program during the period 1988-89. These students were compared to Caucasians in the United States' National Survey of Family Growth (NSFG) conducted in 1988. The proportions of participants who were sexually experienced prior to implementation were not significantly different from teens of the same age in the NSFG. At exit, the students were one year older, and so one would expect the proportion of those who were sexually experienced to have risen. The question, however, is whether the proportion was as high as that for teens of the same age in the NSFG (assumed to be representative of the general American population). Immediately following the intervention, Klaus reports a significant difference (i.e., lower proportions becoming active) for the following groups of teens: females aged fifteen through seventeen years (aged sixteen through eighteen years at exit) and males aged fifteen years (sixteen years at exit). At a one-year follow-up, the difference remained statistically significant only for females who were sixteen years-old at entry (age eighteen at the one year post-test) (Klaus and Kardatzke, 1990: 37).

These findings should be interpreted with caution, as there is a risk that problems arising from selection threaten the internal validity of Klaus' study. She mentions that respondents in the NSFG are representative of the general population, but readers are not told how participants in her program may be similar to or different from the 'typical' teenager.

The Need for Program Evaluation

The importance of program evaluation lies in the potential for research findings to influence decisions about the continuation, expansion, modification or cessation of a wide variety of social programs. Evaluation research can be used to convince sponsors to provide funding for programs and often results in increased cooperation among institutions and agencies. School administrators, for example, may feel more comfortable allowing health service agencies to implement programs in classrooms when these programs are periodically evaluated (Howard, 1991: 597-599). The need for good program evaluation is also apparent when one considers the necessity of using community resources in the best way possible. Often, interventions thought to be effective are, in fact, not working very well at all, while others may be having more success than expected (Howard, 1991: 595-6). An accurate assessment of the impact of these programs is essential when making decisions about the allocation of resources. Moreover, according to Bauman et al. (1994: 108), the usefulness of meta-analyses of programs depends on the availability of studies that have been well-designed. Finally, the process of evaluation itself can lead to improvements in a program because it forces those involved in the administration of the intervention to consider exactly how the program is set up and think realistically about the program's objectives (Wilson and Kirby, 1984: 16-7).

The S.T.A.R. program was implemented in a Catholic secondary school in London, Ontario at the beginning of the 1996-97 school year in response to educators' beliefs that they could "do better" than the current family life education curriculum in terms of encouraging abstinence among students and increasing knowledge about both the

physical and social-psychological aspects of sexuality.

There are several reasons why one may expect the S.T.A.R. program to be successful in meeting its outcome objectives. First, the timing of the program is appropriate. Card et al. (1992: 10), among others, argue that teaching teens to deal with social pressure to engage in intercourse should be done before they become sexually active. Moreover, the program is built on a set of values that are clearly and consistently emphasized over the school year. Sessions do not involve simply the presentation of information, but involve students in such activities as class discussions, role-playing, examinations of values and attitudes, and experiential learning. Finally, the program lasts for almost one full school year. Because teens are surrounded by competing sources of influence such as peers and the media, longer programs may have a stronger impact (Card et al., 1992: 10). One's expectations should be tempered, however, by Miller and Paikoff's recommendation that program sessions occur at least once each week. S.T.A.R. sessions may be held as infrequently as once every two weeks.

The S.T.A.R. program is an important one to study not only because it is consistent with many of the suggestions offered by various authors, but also because it allows us to address new research questions. 'S.T.A.R.' is unique because it revolves around a specific religious (Roman Catholic) viewpoint. While differential impact for males and females has been observed in many other programs, it is possible here to also investigate whether outcomes differ depending on the religion of participants, as both Catholic and non-Catholic students attend Catholic secondary schools in Ontario.

The following evaluation will attempt to ascertain both the extent to which planned

program outputs were put in place (process evaluation) and the degree to which the various goals of the program were realized (outcome evaluation). First, the results of a process evaluation will be presented in order to assess program implementation. It should be noted that the description and program logic model presented above are derived from the curriculum designed by Klaus and do not necessarily reflect exactly what took place in the classrooms involved in the study. Basch et al. (1985: 315-7) stress the importance of ensuring that programs are fully implemented before an impact evaluation is conducted. Regardless of any statistically significant differences between groups or observations at different points in time, it is impossible to attribute a so-called 'outcome' to a given program if one does not know whether planned program activities have even taken place. Secondly, the impact of the program on the knowledge, attitudes and behaviour of program participants will be estimated. An attempt will be made to develop some conclusions about the soundness of the program theory, and implications for future programming and further evaluation will be discussed.

CHAPTER II

Methods

The purpose of this study is to evaluate the S.T.A.R. program. The evaluation is based on the implementation of the program at a Catholic secondary school in London, Ontario. This study has three goals. The first is to ascertain the extent to which the program was implemented. The evaluation needs to establish how closely the intervention that is implemented corresponds to the curriculum specified in the manual. The second aim is to discover the extent to which the program produced the results intended in the areas of knowledge, attitudes and behaviour. Finally, an attempt will be made to evaluate the theoretical underpinnings of the program.

Design

The “crux” of impact analysis, according to Mohr (1995: 4), is the comparison of what appears after the implementation of a program with what would have appeared had implementation not occurred. Although this state of affairs can never be known for sure, it may be estimated. The estimate is referred to as the counterfactual. When evaluators speak about research designs, they are essentially referring to various ways of estimating the counterfactual (Mohr, 1995: 85). In this study, a quasi-experimental design, specifically, a pretest post-test non-equivalent comparison group (also called comparative change) design is employed. The estimate of the counterfactual is provided by a Catholic secondary school where the program was not implemented. The design may be illustrated in the following manner:

Treatment Group	O_{1T}	X	O_{2T}
Comparison Group	O_{1C}		O_{2C}

The main threat to internal validity posed by this design is selection (Cook and Campbell, 1979: 53). Without randomly assigning individuals to either a treatment or control condition, one can never be completely certain that any group differences emerging after an intervention are caused by the treatment rather than being a function of initial differences between the groups. It is not possible, in the present context, to randomly assign students to a school irrespective of the neighbourhood in which they live, where their friends are or where their parents want them to attend. Moreover, random assignment can introduce problems such as contamination, compensatory rivalry or demoralization (Cook and Campbell, 1979: 54-55). While a comparison of pretest scores on the dependent variables may ameliorate some of the concern with selection effects, it is possible that the groups differ in terms of other factors that influence post-test scores. Thus, it is important to provide evidence that the comparison group selected is an appropriate one.

The two schools involved in this evaluation are the most recently built schools in the city and have attracted a significant proportion of non-Catholic students (17.7 and 12.8 percent of the sample in the S.T.A.R. group and comparison group, respectively, is not Catholic). The mean family incomes in the geographical areas that the program and comparison schools serve are, respectively, \$53 259 and \$63 676 per annum (Statistics Canada, 1994: 18-89). It is possible that the different economic backgrounds of the students at the two schools may create a selection-interaction effect, thereby threatening internal validity of findings. The seriousness of the problem is mitigated in two ways. First, the direction of bias is known and second, it works against finding the program to be effective. Adolescents from lower income families are more likely to become sexually active than teens of a higher socioeconomic status (Miller and Moore, 1990: 1028; Voydanoff and Donnelly, 1990: 28; Forste and Heaton, 1988: 252). Thus, any findings

indicating that the program had an impact on the S.T.A.R. group students increases the likelihood that the impact is “real,” as they are being compared to teenagers from a higher income area.

It is important to note that the comparison group employed in this investigation is not a “no treatment” group. Rather, participants of the S.T.A.R. program are being compared to students who are receiving the usual grade nine Religion and Family Life program offered in Catholic secondary schools in Ontario. Moreover, students in the “program group” receive the S.T.A.R. program in addition to, not instead of, the regular curriculum. The key question addressed by this evaluation is, “Is the S.T.A.R. program better than the existing sexuality education curriculum alone?”

The design employed has a number of advantages over other possibilities. According to Cook and Campbell (1979: 98) for example, the post-test only design with a non-equivalent comparison group is common because treatments are often implemented before investigators have the opportunity to prepare studies, so the design is worked out after the intervention has begun. In cases such as these, selection poses a much larger threat to the internal validity of findings than is the case with the design employed in this study (Cook and Campbell, 1979: 98-9). One of the strengths of this design lies in the fact that data at the pretest and the post-test are collected from the same groups of students. This means that estimates of the variance are generally more accurate (i.e., not inflated) relative to designs where different samples are used at the pretest and post-test.

The Sample

A total of 497 grade nine students in London, Ontario are included in the analysis. Of these, 299 attend the Catholic secondary school where the program was implemented and the remainder, 198, who attend a second Catholic high school, comprise a non-equivalent

comparison group. Because secondary schools in Ontario are required to admit students of any religion, the student body is composed of both Catholics and non-Catholics. The composition of the sample is described in Table 2.1.

Table 2.1 Composition of the Sample

	Female N=249		Male N=248	
	Catholic N=184	Non-Catholic N=65	Catholic N=195	Non-Catholic N=53
Program School	108 (21.7%)	25 (5.0%)	138 (27.8%)	28 (5.6%)
Comparison School	76 (15.3%)	40 (8.1%)	57 (11.5%)	25 (5.0%)

Measures

Self-administered questionnaires assessing knowledge of sexuality (including information about the male and female reproductive systems), attitudes toward sexual matters such as premarital intercourse, and sexual behaviours were completed by all students in the sample two weeks prior to the intervention in September, 1996 and two weeks after the completion of the program at the end of May, 1997. Two weeks before this study began, a pilot test of the questionnaire was conducted among a group of approximately sixty students, including both males and females who attended grade nine classes at a third Catholic secondary school in London (the school was used for neither treatment nor comparison purposes). This test was carried out to ensure that the wording of the questions was appropriate for grade nine students and the length of the questionnaire was reasonable for administration in a seventy minute period.

The variables on which impact is measured are not limited to the initiation of intercourse, as changes that the program is expected to produce are believed to lead to modifications in sexual behaviour. While achievements in such areas as knowledge and attitudes may not be the major outcome variables, they represent what Mohr (1995) refers to as 'subobjectives'. These are considered to be instrumental in the achievement of change in the outcome variable of interest. Subobjectives are listed as short-term and long-term outcomes in the program logic model and ideally, argues Mohr (1995: 31), should be both individually necessary and collectively sufficient to attain the outcome of interest. Although it is extremely useful, Mohr (1995: 32) notes that the analysis of subobjectives is uncommon. Such an analysis can often help researchers to answer questions about *why* an intervention did or did not produce a given impact. For example, if a program 'fails' despite the fact that all subobjectives were met, this would cast doubt on the fitness of the program theory. It is the attention paid to the assumed mechanisms

of change that makes for a theory-driven evaluation (Chen and Rossi, 1989: 301-302). Moreover, information on the mechanisms by which program activities have an impact is useful when generalizing results to similar interventions or developing new programs (Mohr, 1995: 33).

Knowledge

Questions about the students' knowledge on various subjects are derived from material taught during the course of the S.T.A.R. program, and may be divided into the following three main categories: emotions and relationships, church teachings and fertility.

Questions relating to topics that were not covered by S.T.A.R. teachers are deleted from the analysis, as the evaluation is focused on the program as it was actually implemented.

The number of questions related to any given topic is roughly proportional to the amount of time spent on that topic during the program. The number of items in each category is as follows:

	<i>Number of Items for Males</i>	<i>Number of Items for Females</i>
Emotions and Relationships	6	6
Church Teachings	6	6
Fertility	24	32

Spearman-Brown reliability coefficients for the three sets of items related to knowledge of emotions and relationships, church teachings, and fertility are, respectively, .363, .487 and .629. These low values indicate that the items do not combine to form a reliable scale. Concern with lack of reliability is somewhat mitigated when one considers that the items involved are knowledge-based. Unlike questions that pertain to attitudes,

for example, items used to assess knowledge are derived from material taught during the course. Thus, while the items may not be reliable *as a set*, they are valid in the sense that they are used to test students' understanding of specific facts that teachers and counsellors thought were important for students to know.

Behaviour

In addition to the knowledge-based questions, respondents are asked whether they have ever engaged in various sexual behaviours. These include "making out," making out to the point that at least one partner had an orgasm, and having intercourse. Further, students are asked whether they have engaged in these activities "during the past three months."

Attitudes

Four questions are posed to ascertain how accepting students are of premarital sexual intercourse under different circumstances. They are asked if they find sexual intercourse to be acceptable whenever the opportunity arises, when they are in a dating relationship, when they are in a long term dating relationship and when they are in love. These four items are combined to form a 'sexual permissiveness' scale (ranging from zero to four points) that yields a Spearman-Brown reliability coefficient of .803. Students are also asked how important they believe it is to make a personal decision regarding whether or not to engage in premarital sexual activity and how comfortable they feel discussing sex with their parents. Scores on each of these two items may range from one to five.

Methods

Implementation of the Program

The first aim of this study is to ascertain the extent to which the planned program was implemented. Details about such things as the content of the course, the length of time spent on various topics, and problems with implementation were obtained during a group interview with teachers involved in the program shortly before the last S.T.A.R. session in May 1997. This information is supplemented with notes taken during a meeting of the teachers after the intervention was completed.

Measuring Program Impact

It is reasonable to expect that students in both the treatment and the comparison group would exhibit changes in their knowledge, attitudes and behaviour over the course of the school year regardless of whether they were exposed to the intervention. To estimate the impact on any given variable, then, it is necessary to examine the *difference in the amount of change between the two groups*. Simply, impact is estimated in the following manner:

$$\text{Impact} = (T_{\text{Time 2}} - T_{\text{Time 1}}) - (C_{\text{Time 2}} - C_{\text{Time 1}}),$$

where T refers to the treatment group's mean score on the variable of interest and C refers to the comparison group's mean score on that variable.

In designs using a non-equivalent comparison group, the most common analytical techniques are variations of the ANOVA (analysis of variance) or ANCOVA (analysis of covariance) procedures (Cook and Campbell, 1979: 149-50). Cook and Campbell (1979: 150) warn that the various methods, however, usually produce different estimates of the treatment effect. No model is foolproof, as each has its own biases. (For an extended discussion of these techniques, see Cook and Campbell, 1979: 150-85.)

The difficulty with ANOVA or ANCOVA procedures is that one is required to link individual cases between the pretest and post-test. This would entail recording the names of respondents on the questionnaires, or perhaps assigning a numeric code to each student. The respondents in this investigation are young teenagers, who likely think that the issues explored here are highly personal and private. If their answers were not kept anonymous, the students could feel uncomfortable and perhaps be suspicious that their responses would be linked with their names. They may not answer the questions honestly and their responses could be unreliable. Thus, questionnaires were not linked across the pretest and post-test. The analysis that this permits produces results whose precision is known with less certainty than would have been the case if linkage was accomplished. However, this trade-off is being made to ensure that good quality data are gathered.

A second possibility is to use t-tests to ascertain whether the mean change exhibited by the S.T.A.R. group differs significantly from that which occurred in the comparison group. A t-test will be conducted for each of the outcome variables to determine whether students exposed to the program exhibited a significantly different amount of change over the course of the school year than did those attending the comparison school.

The main problem with the data collected is the inability to estimate the correlation between pretest and post-test scores on any given variable. When calculating an estimate of pooled variance, it is necessary to correct for the correlation in scores if the groups

involved are not independent by the factor $(1-r)$.¹ Without linking the cases across the pretest and post-test, the value of r is unknown. If it is assumed to be zero, the resulting estimate of the standard error will be inflated, making it more difficult to reject the null hypothesis of no difference. While this may increase one's confidence that any differences reported are in fact "real," it also increases the likelihood of making a Type II Error (failing to reject a false null hypothesis). Hence, findings based on the data available will be presented alongside those that would have been generated, given various levels of covariance. Three hypothetical coefficients will be used in this simulation: a weak correlation ($r=0.25$), a moderate correlation ($r=0.50$) and a strong relationship ($r=0.75$).

The analysis will be conducted separately for the following four groups: female Roman Catholics, female non-Catholics, male Roman Catholics and male non-Catholics. Throughout the course of the program, classes were segregated by sex and there were some differences in the topics discussed in sections for males and the sections for females. Thus, one would expect the level of impact to vary according to sex. Because the program was developed from a Catholic perspective, and many of the participants are not Catholic, it is important to examine the impact separately for Catholic and non-Catholic students. In other words, because the program was designed with Catholic

¹ The justification for the use of the factor $(1-r)$ is provided by Professor Tom Wonnacott of the Department of Statistical and Actuarial Sciences at the University of Western Ontario:

Where $n_1 = n_2$ and $s_1^2 = s_2^2$, the square of the standard error of $T_2 - T_1$, or of $C_2 - C_1$, is

$$SE^2 = \frac{(s_1^2 + s_2^2 - 2rs_1s_2)}{n} = \frac{(2s^2 - 2rs^2)}{n} = \left(\frac{2s^2}{n}\right)(1-r)$$

This factor should not be applied when combining the two pooled estimates in the calculation of the standard error of the difference because the comparison group and treatment group are two independent samples.

views in mind, data pertaining to Catholic students provide a better, more critical test of the program's effectiveness.

Assessing the Program Theory

Finally, an attempt is made to gain a sense of the soundness of the program theory. The purpose of this section is to allow for the generation of hypotheses about the importance of the various components of the program that are assumed to affect behaviour. For example, an increase in knowledge of human reproductive systems is expected to produce a decrease in the rate of initiation of sexual intercourse.

An ideal way to assess the possible influence of various components would be to observe whether *changes* in knowledge and attitudes are significantly associated with *changes* in sexual activity. Without linking individual cases across the pretest and post-test, this is not possible. Instead, t-tests will be conducted to ascertain whether those who have engaged in sexual intercourse over the past three months differ significantly, in terms of knowledge and attitudes, from those who have not. Separate tests will be conducted for those in the treatment group and the comparison group at both the pretest and the post-test. Subjects will not be divided into smaller groups on the basis of sex or religion because many of the cell sizes for categories where subjects have engaged in sexual behaviours would be very small.

The Impact of Multiple Comparisons on the Alpha Level

An alpha level of .05 has been selected as the basis for rejecting the null hypothesis that the program group and comparison group do not differ significantly in terms of the amount of change they demonstrate on the variables measured. This means that there is a probability of .05 that we will falsely reject the null hypothesis. In this investigation, the

impact of the program is assessed by conducting twelve t-tests for each of the following four groups: non-Catholic females, Catholic females, non-Catholic males and Catholic males. Agresti and Finlay (1997: 446) remind us that the error probability of .05 applies for each t-test conducted. This means that for each group of hypotheses, we would expect to commit a Type I error $12 (.05) = 0.6$ times. This implies that, in total, we are likely to find approximately three significant differences by chance alone. When attempting to assess the program theory by comparing sexually active and abstinent students, four t-tests are conducted for each of the program components. This means that, for each group of comparisons, the expected number of Type I errors is approximately $4 (.05) = 0.2$.

There is a simple way to mitigate this potentially serious problem. In order to control the probability of error for all comparisons simultaneously, Agresti and Finlay (1997: 447) recommend the use of the Bonferroni technique. This procedure requires that the alpha level chosen be divided by the number of tests performed (Agresti and Finlay, 1997: 447). Hence, for the tests of the program's impact, the alpha level for each comparison made will be $.05 \div 12 = .0042$. This will result in an overall multiple comparison error rate for each group of .05, which means that the probability of falsely rejecting the null hypothesis *once* in the entire set of comparisons is .05. When comparing the knowledge and attitudes of sexually active and abstinent students, an alpha level of $.05 \div 4 = .0125$ will be employed in order that the overall rate of error for each variable assessed is .05.

CHAPTER III

Results

Implementation

The S.T.A.R. curriculum requires teachers to operate the program for a minimum of six to seven months and hold sessions at least once every two weeks. In this case, fifteen bi-weekly sessions were held on Mondays from mid-September of 1996 to mid-May of 1997. The duration of each session was seventy-five minutes. Students were segregated by sex and were divided into a total of eleven classes. Each class contained an average of twenty-seven students. Only two students did not complete the program, as they were removed for persistent failure to behave appropriately.

During group meetings, teachers revealed a number of difficulties related to the implementation of the intervention. The main problems that emerged over the course of the school year include the following:

1. Classes for males and females were never brought together. According to the curriculum, students were to be segregated by sex during instruction on fertility and then brought together for discussions of such topics as emotions and attitudes.
2. Teachers of female classes came to the conclusion that they put too much emphasis on physiology and anatomy at the expense of other topics. It is estimated that approximately 65 percent of the time spent with the young women was devoted to the female reproductive system alone.
3. Classes for males spent a total of 30 percent of the time on topics related to physiology and anatomy. This was less than the amount of time directed by the curriculum. There was a tendency for classes of males to focus instead on relationships and gender issues.

4. The males did not 'chart' their emotions.
5. Females did not discuss homosexuality and masturbation.
6. None of the classes discussed contraception.
7. Less time was spent on church teachings than the amount directed by the manual.
8. Students were not assigned the project on television programs and commercials. The curriculum included an assignment where students were supposed to make written notes on both positive and negative images of men and women on television.
9. Teachers of male students reported that they often had to spend the first ten minutes of each class trying to gain the full attention of students and get them "under control."
10. The teachers suggested that meeting at the start of the week was not always effective. This also meant missing classes that fell on Thanksgiving and Easter Monday.
11. The teachers concluded that sessions should be held more frequently than every second week. They found that the first part of each class was often spent reminding students of what was discussed in the previous session.
12. Female teachers met weekly to discuss what they had done in their classes as well as make plans for the next session. In contrast, male teachers met only two or three times during the school year. This resulted in the program being implemented more consistently across classes of females than across classes of males.
13. Only one of the three recommended meetings for parents was held. It

occurred shortly before the beginning of the program. Meetings recommended for the mid-point and the end of the course did not take place.

While some of the problems listed are not directly related to the curriculum, it is important to keep in mind that the evaluation involves the program *as it was actually implemented*.

IMPACT OF THE PROGRAM

The Importance of Covariance

As previously mentioned, failure to take the covariance between pretest and post-test scores into account results in inflated estimates of the standard error. Unfortunately, it is not possible to calculate these values without linking individual cases across the pretest and post-test. In order to compensate for this, analyses based on various hypothetical levels of covariance will be presented. Results are presented for the following four groups: female non-Catholics; female Catholics; male non-Catholics; and male Catholics. Group pretest and post-test mean scores for both the S.T.A.R. group and comparison group will be presented. The t-values listed refer to the *difference in the amount of change* demonstrated by the two groups.

Currently, there is no definite information about what level of correlation one might expect between pretest and post-test scores in the areas of knowledge, attitudes and behaviour. It is possible, however, that readers may have their own ideas about what an appropriate value might be. It is for this reason that four sets of results are presented.

The first set is based on the data available with no correction factor applied. The other three sets of results will assume, respectively, a modest ($r=0.25$), a moderate ($r=0.50$) and a strong ($r=0.75$) correlation. The focus of the discussion of findings will be on the findings generated using an estimate of the correlation between pretest and post-test scores of $r=0.25$. This means, therefore, that this is a relatively conservative test of the program's impact. In comparison with other possible estimates of covariance, the use of a modest coefficient makes it relatively difficult to reject the null hypothesis that the program group and comparison group did not differ in the amount of change they demonstrated over the course of the school year.

Minimum and maximum possible scores on each of the measures are as follows:

	Minimum	Maximum
KNOWLEDGE:		
Emotions and Relationships	0	6
Church Teachings	0	6
Fertility	0	24 for males, 32 for females
ATTITUDES:		
Important to make personal decision regarding sex	1	5
Comfort talking to parents about sex	1	5
Sexual permissiveness	0	4

BEHAVIOUR:

Scores on all behavioural items are expressed as percentages and thus may range from 0 to 100 percent.

Table 3.1: Findings for Non-Catholic Females

	S.T.A.R. School		Comparison		t-value (r=0)	t-value (r=.25)	t-value (r=.5)	t-value (r=.75)
	Before N=25	After N=25	Before N=36	After N=45				
KNOWLEDGE								
Emotions and Relationships	2.8	3.4	2.4	2.9	0.237	0.273	0.335	0.473
Church Teachings	3.0	3.8	2.7	3.8	-0.628	-0.726	-0.889	-1.257
Fertility	8.5	11.2	9.5	10.9	0.901	1.041	1.275	1.803
ATTITUDES								
Important personal decision	4.0	4.0	3.9	3.4	1.463	1.689	2.069	2.926
Comfort with talking to parents about sex	2.5	2.6	2.3	2.4	-0.012	-0.014	-0.017	-0.024
Sexual permissiveness	1.6	1.8	2.0	2.4	-0.886	-1.022	-1.253	-1.772
BEHAVIOUR (percentages)								
Have made out	40.0	56.0	50.0	71.4	-0.306	-0.354	-0.433	-0.613
Have made out during the past three months	32.0	32.0	18.8	46.9	-1.708	-1.972	-2.415	-3.415*
Have made out to orgasm	24.0	32.0	3.1	36.7	-1.738	-2.007	-2.458	-3.477†
Have made out to orgasm during the past three months	16.0	24.0	3.1	30.6	-1.453	-1.678	-2.055	-2.906
Had intercourse	4.0	20.0	0	30.6	-1.318	-1.522	-1.864	-2.636
Had intercourse during the past three months	4.0	20.0	0	20.4	-0.415	-0.479	-0.587	-0.830

* $p \leq .004$ † $p \leq .001$ $df=61$

Table 3.2: Findings for Catholic Females

	S.T.A.R. School		Comparison		t-value (r=0)	t-value (r=.25)	t-value (r=.5)	t-value (r=.75)
	Before N=114	After N=102	Before N=68	After N=81				
KNOWLEDGE								
Emotions and Relationships	2.6	3.5	2.9	2.9	2.970*	3.429†	4.200†	5.939†
Church Teachings	3.6	3.9	3.8	3.6	1.234	1.425	1.745	2.468
Fertility	8.8	12.3	9.9	11.0	3.155*	3.643†	4.462†	6.310†
ATTITUDES								
Important personal decision	4.0	4.2	4.1	4.0	1.315	1.518	1.859	2.623
Comfort with talking to parents about sex	2.6	2.9	2.5	2.5	1.357	1.567	1.919	2.714
Sexual permissiveness	1.6	1.9	2.0	2.2	0.626	0.723	0.885	1.251
BEHAVIOUR (percentages)								
Have made out	54.4	65.7	48.5	61.7	-0.181	-0.209	-0.256	-0.363
Have made out during the past three months	35.1	44.1	23.5	42.0	-0.939	-1.084	-1.328	-1.878
Have made out to orgasm	21.1	36.3	8.8	30.9	-0.786	-0.908	-1.112	-1.573
Have made out to orgasm during the past three months	12.3	25.5	4.4	26.5	-1.158	-1.337	-1.637	-2.316
Had intercourse	5.3	11.8	5.9	17.3	-0.772	-0.891	-1.091	-1.543
Had intercourse during the past three months	2.6	9.8	2.9	12.4	-0.420	-0.485	-0.594	-0.840

* p≤.004 †p≤.001 df=178

Table 3.3: Findings for Non-Catholic Males

	S.T.A.R. School		Comparison		t-value (r=0)	t-value (r=.25)	t-value (r=.5)	t-value (r=.75)
	Before N=26	After N=29	Before N=24	After N=27				
KNOWLEDGE								
Emotions and Relationships	1.8	2.8	2.3	2.2	1.941	2.241	2.744	3.881†
Church Teachings	3.0	2.9	2.6	3.3	-0.241	-0.278	-0.341	-0.482
Fertility	8.2	9.2	9.7	9.3	1.022	1.180	1.445	2.043
ATTITUDES								
Important personal decision	3.2	3.4	4.0	3.4	1.733	2.001	2.451	3.466*
Comfort with talking to parents about sex	2.5	2.3	2.6	2.7	-0.630	-0.727	-0.891	-1.260
Sexual permissiveness	2.5	2.4	2.4	2.7	-0.778	-0.898	-1.100	-1.555
BEHAVIOUR (percentages)								
Have made out	56.0	58.6	54.2	74.1	-0.919	-1.061	-1.300	-1.838
Have made out during the past three months	46.2	34.5	20.8	33.3	-1.341	-1.548	-1.896	-2.681
Have made out to orgasm	38.5	41.4	16.7	29.6	-0.570	-0.659	-0.807	-1.141
Have made out to orgasm during the past three months	23.1	20.7	12.5	14.8	-0.319	-0.368	-0.451	-0.638
Had intercourse	30.8	31.0	12.5	14.8	-0.130	-0.150	-0.184	-0.260
Had intercourse during the past three months	11.5	17.2	8.3	14.8	-0.060	-0.070	-0.085	-0.121

* p≤.004 †p≤.001 df=48

Table 3.4: Findings for Catholic Males

	S.T.A.R. School		Comparison		t-value (r=0)	t-value (r=.25)	t-value (r=.5)	t-value (r=.75)
	Before N=139	After N=136	Before N=57	After N=57				
KNOWLEDGE								
Emotions and Relationships	2.2	2.8	2.4	2.4	2.635	3.042*	3.726†	5.270†
Church Teachings	3.0	3.2	3.4	3.3	1.321	1.526	1.869	2.643
Fertility	9.1	9.6	9.6	10.2	-0.025	-0.029	-0.035	-0.050
ATTITUDES								
Important personal decision	3.8	3.8	3.5	3.6	-0.490	-0.566	-0.693	-0.980
Comfort with talking to parents about sex	2.4	2.6	2.4	2.8	-0.580	-0.670	-0.821	-1.160
Sexual permissiveness	2.2	2.5	2.6	2.8	0.292	0.337	0.412	0.583
BEHAVIOUR (percentages)								
Have made out	53.0	65.4	57.9	77.2	-0.661	-0.764	-0.935	-1.323
Have made out during the past three months	30.9	39.0	38.6	47.4	-0.065	-0.075	-0.092	-0.131
Have made out to orgasm	25.2	39.0	24.6	43.9	-0.530	-0.612	-0.750	-1.061
Have made out to orgasm during the past three months	17.3	21.3	12.3	31.6	-1.714	-1.979	-2.423	-3.427†
Had intercourse	13.0	25.7	12.3	36.8	-1.301	-1.502	-1.839	-2.601
Had intercourse during the past three months	7.8	17.7	7.0	28.1	-1.408	-1.626	-1.991	-2.816

* $p \leq .004$ † $p \leq .001$ $df=190$

SUMMARY: Changes in Knowledge, Attitudes and Behaviour

The results are presented in Tables 3.1 to 3.4. This section presents an outline of the findings that are based on the assumption that the level of covariance is weak ($r=0.25$). Using results based only on the data available (i.e., applying no correction factor) implies that there is no correlation between pretest and post-test scores. While this very conservative test makes it unlikely that one is committing a Type I Error, it is also an unrealistic assumption. On the other hand, following the assumption that the correlation for all items is moderate or high is perhaps too generous. Thus, assuming a weak correlation is a still conservative, but more realistic approach.

Knowledge

Assessments of students' knowledge of sexuality are divided into the following topics: emotions and relationships; church teachings; and human fertility.

Findings for Non-Catholic Females

Female, non-Catholic students exposed to the program exhibited no significant changes in their knowledge of emotions and relationships, church teachings, or fertility relative to their counterparts in the comparison group.

Findings for Catholic Females

Among Catholic females, a significant relative increase in knowledge was observed in the area of emotions and relationships. Students attending the S.T.A.R. program school

demonstrated a net increase of 30.7 percent in their knowledge; their average score increased from 2.7 to 3.5, while the mean for those in the comparison group remained consistent at 2.9 points.

The relative increase in the students' knowledge of fertility was also significant. In the S.T.A.R. group, the mean score rose from 8.8 to 12.3 points. Comparison group students moved from an average 9.9 to 11 correct answers. This difference represents a net increase in knowledge among S.T.A.R. program students of 29.2 percent.

Change in the area of church teachings is non-significant.

Findings for Non-Catholic Males

Male, non-Catholic students exposed to the program exhibited no significant changes in their knowledge of emotions and relationships, church teachings, or fertility relative to their counterparts in the comparison group.

Findings for Catholic Males

Catholic, male students attending the S.T.A.R. program school exhibited a net gain of 33.5 percent in their knowledge of emotions and relationships. Their average number of correct responses increased from 2.2 to 2.8, while those in the comparison group remained consistent at 2.4 points.

Attitudes

Attitudinal measures included the following three variables: 1) the extent to which it is

important to make a personal decision about premarital sex; 2) comfort with talking to parents about sex; and 3) permissiveness toward premarital intercourse.

Findings for Non-Catholic Females

No statistically significant changes in attitudes are observed among non-Catholic, female S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Catholic Females

No statistically significant changes in attitudes are observed among Catholic, female S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Non-Catholic Males

No statistically significant changes in attitudes are observed among non-Catholic, male S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Catholic Males

No statistically significant changes in attitudes are observed among Catholic, male S.T.A.R. participants relative to their counterparts in the comparison group.

Behaviour

Findings for Non-Catholic Females

No statistically significant changes in behaviour are observed among non-Catholic, female

S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Catholic Females

No statistically significant changes in behaviour are observed among Catholic, female

S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Non-Catholic Males

No statistically significant changes in behaviour are observed among non-Catholic, male

S.T.A.R. participants relative to their counterparts in the comparison group.

Findings for Catholic Males

No statistically significant changes in behaviour are observed among Catholic, male

S.T.A.R. participants relative to their counterparts in the comparison group.

FACTORS RELATED TO SEXUAL ACTIVITY

Twenty-four t-tests were conducted in order to ascertain whether students who differ in terms of sexual experience have significantly different mean scores in the following areas: knowledge of fertility, church teachings, and emotions and relationships; sexual permissiveness, the extent to which it is important to make a personal decision about whether to engage in premarital sex, and the degree of comfort in discussing sex with parents. Differences are based on whether students had intercourse during the past three months.

Differences in Attitudes

Comfort with talking to parents about sex

Those who engaged in intercourse within the previous three months did not differ from those who remained abstinent in the degree to which they feel comfortable discussing sex with parents. This finding is consistent across the pretest and post-test among members of both the S.T.A.R. and comparison groups.

The importance of making a personal decision about premarital sex

Those who engaged in intercourse within the previous three months did not differ from those who remained abstinent in the extent to which they think it is important to make a personal decision about engaging in premarital sex. This findings is consistent across the pretest and post-test among members of both the S.T.A.R. and comparison groups.

Sexual permissiveness

Findings regarding sexual permissiveness are significant ($p=.0001$) and persist across the pretest and post-test for both the S.T.A.R. group and the comparison school. Students who had engaged in sexual intercourse over the past three months had more permissive attitudes towards premarital sex than did those who were abstinent.

At the pretest, S.T.A.R. group members who had intercourse demonstrated a mean score of 3.6 points on this measure, while abstinent students had an average of 1.8 points. The average scores for students in the comparison group are 3.9 and 2.2 points, respectively.

At the post-test, sexually active S.T.A.R. students had a mean score of 3.5 and those who had not engaged in intercourse over the past three months had a mean of 2.0 points. Figures for comparison group members are 3.6 and 2.2 points.

Differences in Knowledge

Fertility

At the pretest, neither the S.T.A.R. nor comparison group exhibited differences with respect to knowledge of fertility. At the post-test, however, those who had experienced coitus had a lower mean score on this variable than did abstinent students. This finding applies to both S.T.A.R. group members ($p=.0089$) and their counterparts in the comparison group ($p=.0109$). The average number of correct responses given by S.T.A.R. group students to questions about fertility was 10 for those who had engaged in sex over the past three months and 11.9 for students who had not had intercourse during this time. Comparable figures for comparison group members are 9.6 and 11.7 correct answers.

Church Teachings

There is no difference between those who were sexually active and those who were not in terms of knowledge of church teachings. This finding is consistent across the pretest and post-test for both the S.T.A.R. and comparison groups.

Emotions and Relationships

Comparison group members at both the pretest ($p=.0052$) and post-test ($p=.0002$) who had engaged in intercourse during the past three months demonstrated that they had less knowledge of emotions and relationships than did abstinent teens. This finding also applies to S.T.A.R. group students at the post-test ($p=.0116$), but not at the pretest. At the pretest, sexually active comparison group members had a mean of 1.5 correct responses, while inactive students had an average of 2.6 correct answers to questions pertaining to emotions and relationships. At the post-test, comparable figures for comparison group members are 2.0 and 2.8 correct answers. The means for S.T.A.R. group members at the post-test are 2.6 and 3.2 for active and abstinent students, respectively.

A summary of these findings is presented alongside mean scores for the various groups in Tables 3.5 through 3.10.

Table 3.5: Differences in comfort with talking to parents about sex

	Mean score for students who have had intercourse in past three months	Mean score for students who have not had intercourse in past three months	t-value	p-value
Pretest				
S.T.A.R. Group	3.3 (N=17)	2.6 (N=288)	1.868	0.063 (NS)
Comparison Group	1.9 (N=8)	2.7 (N=173)	-1.624	0.107 (NS)
Post-test				
S.T.A.R. Group	3.1 (N=44)	2.8 (N=249)	1.206	0.229 (NS)
Comparison Group	2.8 (N=40)	2.7 (N=174)	0.799	0.257 (NS)

Table 3.6: Differences in the extent to which it is important to make a personal decision regarding engaging in premarital sex

	Mean score for students who have had intercourse in past three months	Mean score for students who have not had intercourse in past three months	t-value	p-value
Pretest				
S.T.A.R. Group	3.4 (N=17)	3.7 (N=288)	-0.984	0.3258 (NS)
Comparison Group	3.5 (N=8)	3.8 (N=173)	-0.603	0.5476 (NS)
Post-test				
S.T.A.R. Group	3.2 (N=44)	3.8 (N=249)	-2.021	0.0486 (NS)
Comparison Group	2.9 (N=40)	3.6 (N=174)	-2.364	0.0190 (NS)

Table 3.7: Differences in sexual permissiveness

	Mean score for students who have had intercourse in past three months	Mean score for students who have not had intercourse in past three months	t-value	p-value
Pretest				
S.T.A.R. Group	3.6 (N=17)	1.8 (N=288)	7.992	0.0001
Comparison Group	3.9 (N=8)	2.2 (N=173)	10.180	0.0001
Post-test				
S.T.A.R. Group	3.5 (N=44)	2.0 (N=249)	9.581	0.0001
Comparison Group	3.6 (N=40)	2.2 (N=174)	8.115	0.0001

Table 3.8: Differences in knowledge of fertility

	Mean score for students who have had intercourse in past three months		Mean score for students who have not had intercourse in past three months		t-value	p-value
Pretest						
S.T.A.R. Group	8.4	(N=17)	9.9	(N=288)	-1.772	0.0774 (NS)
Comparison Group	10.8	(N=8)	10.6	(N=173)	0.117	0.9070 (NS)
Post-test						
S.T.A.R. Group	10.0	(N=44)	11.9	(N=249)	-2.633	0.0089
Comparison Group	9.6	(N=40)	11.7	(N=174)	-2.646	0.0109

Table 3.9: Differences in knowledge of Catholic Church teachings

	Mean score for students who have had intercourse in past three months		Mean score for students who have not had intercourse in past three months		t-value	p-value
Pretest						
S.T.A.R. Group	3.1	(N=17)	3.2	(N=288)	-0.188	0.8511 (NS)
Comparison Group	2.6	(N=8)	3.3	(N=173)	-1.034	0.3028 (NS)
Post-test						
S.T.A.R. Group	2.9	(N=44)	3.5	(N=249)	-1.852	0.0650 (NS)
Comparison Group	3.3	(N=40)	3.5	(N=174)	-0.807	0.4205 (NS)

Table 3.10: Differences in knowledge of emotions and relationships

	Mean score for students who have had intercourse in past three months		Mean score for students who have not had intercourse in past three months		t-value	p-value
Pretest						
S.T.A.R. Group	1.9	(N=17)	2.4	(N=288)	-1.445	0.1496 (NS)
Comparison Group	1.5	(N=8)	2.6	(N=173)	-2.794	0.0052
Post-test						
S.T.A.R. Group	2.6	(N=44)	3.2	(N=249)	-2.489	0.0116
Comparison Group	2.0	(N=40)	2.8	(N=174)	-3.764	0.0002

CHAPTER IV

Discussion of Findings

SUMMARY OF FINDINGS

Implementation

Major discrepancies between the curriculum and the actual program involved the following: the failure to bring male and female students together for sessions; omission of such topics as contraception, homosexuality and masturbation; inconsistencies in the program for males; and little attention to the teachings of the Catholic Church. These problems may be largely associated with the fact that this was the first time that the program was offered in London. As teachers gain experience with the curriculum and become more comfortable with the material, it is likely that improvements in implementation could follow.

Three important conclusions emerge from this process evaluation. First, the implementation objectives were not all met. These departures from the ideal program can be expected to result in less impact than may have been the case if implementation had been complete. Moreover, the extent to which the intervention is put in place has implications for the quality of the test of the program's impact. The best test of the program would be one based on a situation where the entire program was implemented exactly as outlined in the curriculum.

Second, implementation of the program for females was closer to the ideal than the implementation for males. Further, the program was implemented more consistently across classes for females than classes for males. As a result, an examination of the impact of the intervention on females constitutes a better test of the program's effectiveness than does the analysis involving males.

Third, the difference in the extent to which the program was implemented for females and males, combined with the Catholic perspective from which the intervention is derived, means that the best opportunity to test the impact of the program is the case of Catholic females.

Changes in Knowledge, Attitudes and Behaviour

As previously mentioned, the evaluation of the program is based on the assumption that the average correlation between pretest and post-test scores is $r=0.25$.

Knowledge

Assessments of students' knowledge of sexuality were conducted in the areas of fertility, church teachings, and emotions and relationships.

The only area in which the majority of S.T.A.R. students demonstrated a statistically significant relative increase in knowledge of emotions and relationships. That is to say that their knowledge improved more than that of students in the comparison group. A significant relative improvement in knowledge of emotions and relationships was noted among Catholic students, who comprise 82.3 percent of the S.T.A.R. group. Differences for non-Catholics were non-significant.

Catholic females also demonstrated a statistically significant amount of relative change in their knowledge of fertility. No significant changes in this area were noted for any of the other groups of students.

Attitudes

Students' attitudes towards the importance of making a personal decision about premarital sex, comfort discussing sex with parents and sexual permissiveness were examined. No groups of S.T.A.R. students exhibited significant attitudinal changes relative to students in the comparison group.

Behaviour

Statistically significant behavioural changes were not noted among any groups of S.T.A.R. students relative to their counterparts in the comparison group.

Factors Related to Sexual Activity

Differences between students who were sexually active and those who were abstinent within the past three months were assessed in terms of mean scores on key program components. Measures included knowledge of fertility, emotions and relationships, and church teachings; sexual permissiveness; the extent to which it is important to make a personal decision about whether to engage in premarital sex; and the degree of comfort with talking to parents about sex.

Knowledge

At the pretest, neither the S.T.A.R. nor the comparison group exhibited differences with respect to knowledge of fertility. At the post-test, however, those who had experienced coitus within the past three months had a lower mean score on this variable than did

abstinent students. This finding applies to both S.T.A.R. group members and their counterparts in the comparison group.

Comparison group members at both the pretest and the post-test who had engaged in intercourse during the past three months demonstrated that they had less knowledge of emotions and relationships than did abstinent teens. This findings also applies to S.T.A.R. group members at the post-test, but not at the pretest.

There is no significant difference between sexually active and abstinent students with regard to knowledge of church teachings.

Attitudes

Those who engaged in sexual intercourse within the past three months did not differ from those who remained abstinent in the degree to which they feel comfortable discussing sex with parents or in the extent to which they think it is important to make a personal decision about engaging in premarital sex.

Students who engaged in sexual intercourse over the past three months had more permissive attitudes toward premarital sex than did those who were abstinent ($p \leq .0001$). This finding persists across the pretest and post-test for both the S.T.A.R. group and the comparison school.

IMPLICATIONS FOR THE PROGRAM THEORY

Generally, when implementation has been unsatisfactory, one cannot be sure whether a lack of observed impact is due to failure of implementation or failure of the program

theory. However, by examining differences between sexually active and abstinent students in terms of their scores on major components of the program, it is possible to draw tentative conclusions about the fitness of the theory underlying the intervention.

Differences in Attitudes According to Sexual Behaviour

Comfort with talking to parents about sex

It has been argued in the literature that parental values regarding sexuality are most readily transmitted to adolescents under conditions of open parent-child communication (Card et al., 1992: 2). Moreover, the more closely the attitudes of children resemble those of their parents, the less likely teenagers are to engage in sexual intercourse. One of the subobjectives of the program was to make students feel comfortable talking about sex with adults as well as to encourage students to discuss sex with their parents, as this was believed to make the teens less likely to have intercourse.

However, those who engaged in intercourse over the past three months did not differ from those who remained abstinent in the degree to which they felt comfortable discussing sex with their parents. This finding applies to members of both the S.T.A.R. and comparison group. This lack of difference does not lend support to the beliefs concerning adolescent-parent communication that underlie the development of the program.

The importance of making a personal decision about sex

A number of studies report that the majority of sexually active adolescents say that their

first act of intercourse was not planned, but “just happened” (e.g., Brooks-Gunn and Furstenberg, 1989: 251; Miller and Moore, 1990: 1026; Zabin, 1990: 267). According to the program theory, if teenagers make a personal decision about whether they will engage in intercourse before they are actually confronted with a situation in which intercourse may occur, they are less likely to have sex.

This argument is not supported by the findings of this investigation. Students who had engaged in intercourse during the previous three months did not differ from those who remained abstinent in terms of the extent to which they think it is important to make a personal decision about whether to engage in premarital intercourse.

Sexual permissiveness

Attitudes and values surrounding premarital intercourse are discussed within a context of the biological, emotional and religious aspects of human sexuality. It is believed that once students begin to clarify their values about premarital sex, they will come to the decision that premarital sex is undesirable and develop an appreciation for the teachings of the Catholic Church on this issue. Moreover, underlying the program is the assumption that values and attitudes have a causal impact upon behaviour.

Students who engaged in intercourse during the past three months had more permissive attitudes toward the acceptability of premarital sex in a variety of situation than did those who remained abstinent. This finding applies to both the S.T.A.R. group and comparison group and persists across the pretest and post-test. One cannot be certain, however, that attitudes preceded behaviour. It is also reasonable to argue that students

developed certain attitudes toward sex as a result of their experiences. Nevertheless, the relationship is consistent with the program theory.

Differences in Knowledge According to Sexual Behaviour

Fertility

One of the most important parts of the program involved instruction on human fertility. The program theory is that as students develop an in-depth understanding of their bodies and accept that they are capable of reproduction, they will have a greater sense of respect for their sexuality, and be less likely to treat sexual activity lightly. It is assumed that, in turn, they will be less apt to engage in sexual activities including intercourse. While sociological literature generally does not relate knowledge of fertility to the concept of respect for sexuality or the powers of reproduction, it has been argued that teenagers exposed to sex education are less likely to have intercourse than students who do not receive such instruction (see, for example, Kirby et al., 1994: 352; Voydanoff and Donnelly, 1990: 96).

At the pretest, students who engaged in intercourse during the previous three months did not differ in terms of their knowledge of fertility from those who had not had sex. At the post-test, both S.T.A.R. students and comparison group members who had sex had a lower mean score on this measure than did students who were not active during the past three months.

It is possible that, at the pretest, no difference was found because knowledge of fertility was low among most students regardless of sexual experience. As students are

taught a good deal about reproductive anatomy and physiology over the course of grade nine, however, differences emerged. Although this finding certainly does not contradict the view that teaching students about fertility makes them less likely to have sex, one must approach the result with caution. A number of studies have found that students who perform well in school are less likely to engage in intercourse than poorer students (Card et al., 1993: vii). It may be the case that those who learn the most about fertility during the school year are generally better students. Thus, a relationship between knowledge about fertility and sexual activity may be spurious in the sense that they are both related to a third variable, academic performance. Nevertheless, the relationship is consistent with the program theory.

Church Teachings

The program includes a component where students are provided with instruction on the views of the Catholic Church with regard to sexuality. Key teachings involve the connection between intercourse and reproduction as well as the view that sexual intercourse should not take place outside of marriage. According to the program theory, this is an important component because of the way in which the teachings of the Catholic Church intersect with instruction in reproductive physiology and anatomy. Underlying the program is the assumption that, if exposed to these views while at the same time developing a sense of respect for one's sexuality by learning about human fertility, students will develop attitudes that make them less likely to have sexual intercourse.

This assumption is not supported by the present study. There is no statistically

significant difference between those who were sexually active in the past three months and those who were not in terms of their knowledge of Church teachings. Had implementation been complete, this finding would lead to the conclusion that Church teachings are not a useful component of the program. However, it is too early to completely discard the potential importance of Church teachings because much less time was devoted to this topic than the amount recommended in the S.T.A.R. curriculum.

Emotions and Relationships

Another component of the program involved learning about emotions and relationships. Through class discussions, teachers are expected to impart to students knowledge of issues such as what constitutes a committed and love-based relationship, the differences between love and infatuation, and the positive and negative consequences of sexual intercourse. According to the program theory, as students learn this information, they will postpone intercourse.

Findings related to differences between sexually active and abstinent students appear to support this component of the program. Comparison group members at the pretest and post-test, as well as S.T.A.R. students at the post-test, who had engaged in intercourse within the past three months demonstrated less knowledge of emotions and relationships than did students who were not active over the past three months.

Summary

Promoting attitudes that discourage premarital sexual activity appears to be an important

objective in terms of its potential impact on sexual behaviour. Helping students become comfortable discussing sex with their parents does not seem to be relevant with respect to this goal. Support for the inclusion of teachings on fertility and emotions and relationships is provided by the findings of the present study. Knowledge of church teachings, however, does not appear to contribute to the delay of intercourse in this investigation.

It is important to note that all statistically significant differences between sexually active and inactive students were found in both the S.T.A.R. group and the comparison group. Thus, while many of the features of the program are important for delaying intercourse, they are not unique to S.T.A.R. The regular Catholic secondary school curriculum includes instruction on fertility, and matters concerning premarital sex are also discussed in the regular “Religion and Family Life” program offered in Catholic schools. *The key question is whether the S.T.A.R. program does a better job of teaching these important topics than does the regular curriculum.* This issue will be addressed in the following section.

IMPLICATIONS FOR THE SUCCESS OF THE PROGRAM

It must be kept in mind that the comparison group is not a “no treatment” group. Rather, the S.T.A.R. program is being compared with the existing “Religion and Family Life” program. The regular grade nine curriculum deals with many of the same issues addressed in the S.T.A.R. program. Information about the human reproductive system is taught during the regular grade nine curriculum, although there is considerably more emphasis on this topic in the S.T.A.R. program. Also, the Religion and Family Life classes include

Church teachings about sexuality. Moreover, class discussions about social and emotional issues related to premarital sex are also held during the regular curriculum.

Differences in the mean amount of change over time between the S.T.A.R. group and the comparison group were measured on twelve variables for each of four groups of students. Three measures relate to knowledge of sexuality, three variables were used in the assessment of attitudes and students were asked to report on six behavioural items. Thus, a total of forty-eight t-tests were conducted. Of these tests, only three yielded statistically significant differences. The differences noted all pertained to knowledge-based variables.

It has been argued that Catholic females provide the best test of the program's impact. However, results indicating that the program had an impact appear to be concentrated among Catholic students in general rather than just female Catholics in particular. Of the three significant differences noted, two are demonstrated by Catholic females and one by Catholic males.

All significant differences are in the desired direction. This implies that, while the S.T.A.R. program as it was implemented was only marginally better than the existing family life and religion program, it is certainly not less successful. Findings differ according to the sex and religion of the students involved.

Knowledge

Fertility

The S.T.A.R. program leads to improvements in Catholic females' knowledge of fertility.

Although their average score is lower than the comparison group at the pretest, S.T.A.R. group members have a higher mean score than their comparison group counterparts at the post-test. At the pretest, S.T.A.R. group students have an average score of 8.8 correct answers in the area of fertility. This increases to 12.3 accurate responses at the post-test. Figures for Catholic females in the comparison group are 9.9 and 11.0 correct responses, respectively.

Increases in the S.T.A.R. group's and comparison group's knowledge of fertility do not differ significantly for non-Catholic females, non-Catholic males or Catholic males.

Emotions and Relationships

Factual knowledge of emotions and relationships improves significantly more in the S.T.A.R. group than in the comparison group among Catholic females and Catholic, male students. In both of these cases, average scores in the comparison group remain constant between the pretest and post-test, while scores increase among S.T.A.R. group members. Moreover, the S.T.A.R. and comparison groups have similar pretest scores. It is reasonable, therefore, to attribute group differences to the S.T.A.R. program.

The program does not have an effect on non-Catholic females' or non-Catholic males' knowledge of emotions and relationships.

Church Teachings

No significant differences are observed in the area of church teachings. That is to say, the S.T.A.R. program and the existing religion program (taught at the comparison school)

accomplish the same results in this area. As previously mentioned, S.T.A.R. teachers spent less time on church teachings than the amount directed by the curriculum. Thus, it is possible that the lack of impact derived from a problem with implementation rather than from a fault with the curriculum itself.

Attitudes

The S.T.A.R. program does not have an impact on students' attitudes toward sexual matters.

Comfort with talking to parents about sex

The S.T.A.R. program has no impact on students' level of comfort with talking to their parents about sex; over the course of grade nine, those in the S.T.A.R. group do not become more or less comfortable than do students in the comparison group.

Sexual permissiveness

The program does not produce an impact on sexual permissiveness. Students in the S.T.A.R. group do not become any more or less permissive in their attitudes toward the acceptability of sex than do those in the comparison group.

The importance of making a personal decision about sex

The program does not produce an impact on the extent to which students feel it is important to make a personal decision regarding premarital sex. Students in the S.T.A.R.

group do not demonstrate a greater amount of change over the course of the school year than do those in the comparison group with respect to this attitude.

Behaviour

The main goal of the S.T.A.R. program is to influence behaviour. Thus, this is perhaps the most important section of the evaluation. One would expect that, over the course of grade nine, a number of students would experience a variety of sexual behaviours, including intercourse. Thus, an increase in the proportion of S.T.A.R. students engaging in sexual activity should not be regarded as an indication of program failure. Rather, the importance of the evaluation lies in the comparison of the S.T.A.R. group with the comparison group. The experience of the comparison group during the school year is used as an estimate of what would have occurred had the program not been implemented. Thus, it is the *difference in the amount of change* between the S.T.A.R. group and the comparison group that is the key to measuring impact.

Making Out and Making Out to the Point of Orgasm

A number of researchers, for example, Miller and Moore (1990: 1025) and Herold (1984: 26), claim that there is a normative developmental sequence of heterosexual behaviours. According to Herold (1984: 26), this pattern begins with kissing, proceeds to fondling of the breasts, manual stimulation of the genitals and ends with intercourse. Thus, any changes related to making out and/or making out to the point of orgasm are important in that they have an impact on the likelihood or timing of intercourse.

The program does not produce any changes in the prevalence of students who have ever engaged in making out or in the relative proportion who have done so in the past three months. Moreover, the program does not have an impact on the relative proportion of students who experienced making out to the point of orgasm. This finding applies both to the lifetime prevalence of this behaviour as well as activity in the past three months.

Sexual Intercourse

The program has no significant effects in terms of the proportion of students who engaged in intercourse. This finding applies whether one examines those who have *ever* experienced this behaviour or those who have had sex within the past three months.

Assumption of Covariance

While the evaluation is based on the assumption that there is a modest correlation ($r=0.25$) between pretest and post-test scores, results generated using a moderate coefficient of $r=0.50$ yield no further significant differences. Results based on the assumption of a high level of covariance ($r=0.75$) yield the following five additional significant differences:

1. The increase in the proportion of non-Catholic females who have made out within the past three months is lower in the S.T.A.R. group than among comparison group students.
2. The increase in the proportion of non-Catholic females who have ever made out to the point of orgasm is lower in the S.T.A.R. group than among comparison group students.

This finding should be interpreted with skepticism. At the pretest, 24 percent of non-

Catholic, female S.T.A.R. students report experiencing this behaviour, while only 3.1 percent of those in the comparison group do. Post-test scores for the two groups are 32 percent and 36.7 percent. Because the two groups start out with such different pretest scores, it is difficult to attribute a difference in the amount of change to the program itself.

3. Non-Catholic males demonstrate a higher increase in their knowledge of emotions and relationships than do those in the comparison group.
4. Non-Catholic males demonstrate a greater average increase in the extent to which they think it is important to make a personal decision about engaging in premarital sex than do their counterparts in the comparison group.
5. Catholic males in the S.T.A.R. group demonstrate a lower increase in the proportion who have engaged in making out to the point that at least one partner had an orgasm during the past three months than do those in the comparison group.

One of the additional significant differences generated with the use of the coefficient $r=0.75$ pertains to the proportion of students who have ever engaged in making out to the point that at least one partner had an orgasm. It is with respect to the lifetime prevalence of sexual behaviours that the use of a weak level of covariance ($r=0.25$) constitutes that most conservative test of the program's impact.

Two out of the five additional significant differences generated with the use of the coefficient $r=0.75$ pertain to behaviour during the past three months. While one might expect at least a moderate correlation when dealing with the lifetime prevalence of behaviours, this is not the case with items pertaining to recent behaviour. That is to say, if

students are sexually active during the three months prior to program implementation, one should not assume that they will also be active during the last three months of the program. Conversely, students who were sexual inexperienced at the pretest may have engaged in various sexual behaviours including intercourse over the course of the school year. Thus, allowing for a strong correlation for behaviours over the past three months is too generous, and the more modest coefficient of $r=0.25$ is more reasonable.

The two remaining significant differences resulting from the use of a high coefficient pertain to knowledge. Clearly, the use of a strong level of covariance is too generous with respect to knowledge. At the pretest, students were tested on information that they had not yet been taught during school. Thus, there is no reason to expect that there would be a high level of covariance across the pretest and post-test with respect to knowledge-based items, though one would expect it to be stronger in the comparison group than among members of the S.T.A.R. group.

Summary

Overall, the S.T.A.R. program is only slightly more successful than the existing sexuality education curriculum. The program had an impact on participants' knowledge of sexuality, but not on their attitudes or behaviour. The only area in which the majority of program participants fared better than their counterparts in the comparison group was in their knowledge of emotions and relationships. Catholic females as well as Catholic males demonstrated significant improvements over comparison group members in this area. Catholic females were the only group on which the program was successful in increasing

knowledge of fertility.

Although attitudes pertaining to sexual permissiveness are related to sexual experience, students in the program exhibited no significant changes in this area relative to those in the comparison group. The S.T.A.R. program was not more effective than the existing sexuality education program when it came to encouraging students to think about the importance of making a personal decision about engaging in premarital sex, nor did it help students become more comfortable discussing sex with their parents. Finally, the program had no impact on sexual behaviour.

LIMITATIONS OF THE PRESENT STUDY

Several methodological issues limit the conclusions that can be drawn from these findings. Limitations are largely related to the inability to link individual cases across the pretest and post-test, as well as the extremely short post-test period. Conceptual considerations related to sexual behaviour and concerns related to implementation are discussed below.

Dealing With Individual Cases

The inability to follow individual cases across the pretest and post-test poses several analytical problems. Firstly, as previously mentioned, it does not allow us to take into account the covariance between pretest and post-test scores. Although we can estimate what the results would be based on various, hypothetical levels of correlation, we could come much closer to discovering the 'true' impact of the program had linkage been accomplished.

Linking the cases would also allow for the exploration of a number of important substantive issues. For example, the following questions could have been addressed:

1. Does impact vary depending on level of exposure to the program? How much of the program is needed in order to produce a given result?
2. What personal characteristics are associated with change? For example, does impact vary depending on prior sexual experience? Klaus, creator of the S.T.A.R. program, is silent on issues surrounding the impact of prior sexual experience. Moreover, returning to abstinence after having intercourse is not a stated objective of the program and is thus not a condition of a successful program. However, other studies indicate that the issue of prior sexual experience is an important one (see, for example, Barth et al., 1992: 70-2; Bilodeau et al., 1994: 178; Christopher and Roosa, 1990: 70; Eisen et al., 1990: 266-8; Kirby et al., 1991: 262).
3. What personal characteristics are associated with program attendance?
4. Is there a significant correlation at the individual level between change in knowledge of sexuality and changes in sexual behaviour?
5. Is there a relationship between changes in attitudes and behavioural changes? Moreover, do attitudinal changes tend to precede changes in behaviour?
6. How important are the private teacher-student counselling sessions? Does impact vary depending on the length or number of sessions an individual attends or the topics discussed during sessions?

Length of the Post-test Period

The post-test was conducted two weeks after the completion of the program. A longer post-test period would allow for two major improvements in the analysis. First, it would allow one to make inferences about the long term effects of the program. For example, it would be valuable to measure the persistence of changes in knowledge over time.

Moreover, if individual cases had been linked, one could examine whether the persistence of program effects over time varied according to factors such as school performance, sex, religion or program attendance.

Findings indicating a lack of impact may be a function of the short post-test period, as more time could be required for differences between the S.T.A.R. group and the comparison group to emerge. Increasing the length of the post-test period may reveal significant differences that were not previously evident. For example, increases in knowledge or modifications of attitudes may persist longer among S.T.A.R. students than those in the comparison group.

Results related to behaviour may also be affected by the length of the post-test period. For example, the proportion of students who had engaged in intercourse did not exceed 37 percent in any group. Allowing more time for a greater proportion of students to become sexually experienced may reveal differences between program participants and the comparison counterparts. Support for this notion is provided by Barth et al. (1992: 69-70), who report that a post-test period of eighteen months was required before they noted any significant differences between program students and those in the comparison group with respect to the onset of intercourse. While most students do not become

sexually active in grade nine regardless of the programs they may receive, the S.T.A.R. program may help prepare students to deal with pressures and other contingencies that they will encounter over the next few years. Moreover, the goal of the program is not to delay intercourse simply until after grade nine, but throughout adolescence.

Conceptual Considerations

The manner in which variables related to sexual activity were operationalized limits one's understanding of the behaviours that students experienced. While the term "intercourse" clearly refers to sexual intercourse, the term "making out" is somewhat ambiguous.

Secondary school teachers and counsellors advised that the term "making out" is generally understood to include behaviours that ranging from kissing to heavy petting. The term "making out to orgasm" presumably implies that students engaged in these behaviours long enough or intensely enough that at least one partner had an orgasm. One does not know, however, whether this means that students were involved in light petting, heavy petting or oral sex, for example.

Discovering which specific activities students have experienced is important, as it tells us how close students have come to engaging in coitus and to what possible boundaries they are willing to go in their behaviour.

Concerns Related to Implementation

There are two areas in which issues related to implementation limit the conclusions that can be made about the S.T.A.R. program. First, this was the first time that the S.T.A.R.

program was offered anywhere in the City of London. It is unrealistic to expect, therefore, that the entire curriculum could be implemented perfectly. Thus, the results generated pertain not to the S.T.A.R. curriculum itself, but to the program as it was actually implemented. The generalizability of results to the S.T.A.R. curriculum is therefore limited. Had the curriculum been implemented more thoroughly, the findings of this study may have been different. For example, significant differences on a few more, particularly behavioural, dimensions, would lead to the conclusion that the S.T.A.R. program is clearly superior to the Religion and Family Life educational program that is taught in other Catholic secondary schools.

Second, our information about the extent to which the program was implemented is rather sparse. It would be useful to have details about daily classroom activities in order to conduct a more precise process evaluation. This knowledge could be used to ascertain exactly “how much” of the program is needed to produce a given result. Furthermore, knowing exactly how much of the program was implemented would provide us with a better idea of whether lack of impact in certain areas is attributable to problems with implementation or to faults with the program theory.

The Role of Experiential Learning

According to the program theory, experiential learning plays a vital role in helping adolescents to value their sexuality and recognize it as an important part of their self-concept. In particular, learning to recognize cyclical changes in cervical mucous is believed to encourage females to appreciate that they are sexual beings capable of

reproduction. This understanding is believed to foster a sense of respect for their sexuality which is translated into a reduced likelihood of becoming sexually active.

Unfortunately, no data related to personal charting were collected. We know that males did not chart their emotions. Teachers of female students reported that “many” young women kept track of their mucous changes as well as their emotions. However, we have no information about the exact proportion of females who conducted charting, nor do we know the frequency or consistency of the charting.

This is an important shortcoming because such information is relevant when assessing the degree to which the program was implemented. Moreover, the extent to which personal charting was conducted can be expected to have implications for the impact of the program.

IMPLICATIONS FOR FUTURE RESEARCH

Further research on the S.T.A.R. program would be useful if educators are interested in continuing the S.T.A.R. program or expanding the intervention beyond the one high school in which it currently operates.

First, it would be necessary to conduct another evaluation once the program is more fully implemented. At the same time, it would be useful to collect more detailed information on the extent to which the program is implemented. This way, one could be more certain that results pertain to the curriculum. If findings indicated a failure to produce the desired impact, researchers could be sure that the lack of success was a result of the program itself and not because implementation is inadequate. If implementation

improved substantially over the next year or two, it would be possible to replicate this study by executing a post-test-only design with the new group of grade nine students. Data from the pretest could be used in such a study, as it is unlikely that any major historical changes will change the context of secondary school in the near future.

Allowing a longer post-test period would also be useful in order to examine long term effects or to see whether differences between the S.T.A.R. group and the comparison group emerged over time. The same students in both schools could be tested again in May of 1998, and the post-test period would thus be twelve months longer.

As previously mentioned, there exists a normative developmental pattern of sexual behaviours. In a subsequent investigation, it would be worthwhile to include in the questionnaire a list of items asking students whether they have engaged in specific activities. If desired, individual questions could then be combined to form a scale indicating the extent of students' sexual experience.

Further inquiry should be made into the issue of linking individual cases across the pretest and post-test. Every effort should be made to determine whether there is some way of tracking individual cases while still making respondents feel confident that their answers will be treated confidentially. Although there were some important reasons for keeping respondents' answers completely anonymous, linkage would allow researchers to be more certain about the integrity of their findings and to expand the evaluation beyond its current scope.

Finally, data relating to the personal charting of emotions and cervical mucous changes should be collected and analyzed. Because experiential learning is viewed as an

important part of the S.T.A.R. program, the frequency and consistency of charting can be expected to have implications for the impact of the program. If details about personal charting were collected and individual cases were linked across the pretest and post-test, it would be possible to examine the relationship between charting and changes on such dimensions as knowledge, attitudes and behaviour.

CHAPTER V

Summary and Conclusions

SUMMARY

The purpose of this investigation was to evaluate the S.T.A.R. program as it was implemented at a Catholic secondary school in London, Ontario. The study had three goals. The first of these was to measure the extent to which the program was implemented according to the curriculum. The second aim was to ascertain the extent to which the intervention produced changes in the knowledge, attitudes and behaviour of program participants. The key question with respect to this objective was whether the S.T.A.R. program was more successful in eliciting changes than the regular curriculum. Third, the theoretical underpinnings of the program were assessed.

A pretest post-test non-equivalent comparison group (also called comparative change) design was employed. Changes in the knowledge, attitudes and behaviour of program participants were compared to changes that occurred in the comparison group. Differences in the knowledge and attitudes of sexually active and inactive students were also measured.

The S.T.A.R. program was, at best, marginally better than the existing sexuality education curriculum. It produced changes in knowledge, but demonstrated a lack of impact on attitudes and behaviour. Sexually active and inactive students differed in terms of their knowledge of fertility, knowledge of emotions and relationships and sexual permissiveness. These differences lend support to the program theory, which states that these factors have implications for sexual behaviour. Principal concerns related to the quality of the evaluation involve the brevity of the post-test period and the inability to link individual cases across the pretest and post-test.

CONCLUSIONS

Given that factual, knowledge-based items on the questionnaire were drawn directly from material taught during the S.T.A.R. course, it was not unexpected that the program resulted in a greater increase in knowledge of emotions and relationships than did the regular religion and family life program. It is for this reason that it is surprising to find that the program produced relative increases in knowledge of human fertility among only one group of students (Catholic females). The intervention did not produce any improvement over the existing program with respect to knowledge of church teachings, but this is reasonable, given that similar topics are also covered in the regular curriculum and were underemphasized in the implementation of the S.T.A.R. program.

A major part of the program was devoted to the discussion of such topics as attitudes toward premarital sex, self-respect and the importance of making a personal decision about engaging in sex. The program, however, was not successful in eliciting a greater amount of change in these attitudes than that noted among members of the comparison group.

Because changes in knowledge and attitudes are expected to have consequences for behaviour, one would not expect to find a behavioural impact of any great magnitude, given that the program did not have an effect on knowledge or attitudes. Indeed, the program did not have an impact on any of the behavioural items included in this investigation. It would be useful, however, to obtain data that illustrate more clearly what sorts of behaviours students have experienced.

The overall conclusion reached with respect to the intervention is that the S.T.A.R.

program, as it was implemented, is, at best, a marginal improvement on the regular family life and religion program. It led to improvement in knowledge (namely, knowledge of fertility and knowledge of emotions and relationships) but demonstrates a lack of impact in many areas thought to be programmatically relevant. It is important to appreciate, however, that the S.T.A.R. program was not any less effective than the existing Religion and Family Life program with respect to the dimensions studied in this evaluation.

It does appear, however, that some of the variables related to the program's subobjectives (specifically, knowledge of fertility, knowledge of emotions and relationships, and sexual permissiveness) are related to sexual behaviour. A second study should be conducted if there are substantial improvements in the extent to which the intervention is implemented, especially since there is support for the idea that some of the components of the program address matters that implicated in the etiology of teenage sexual experiences. Such a study should implement means of individually linking pre- and post-test responses and extend at least six months to one year beyond the end of the program.

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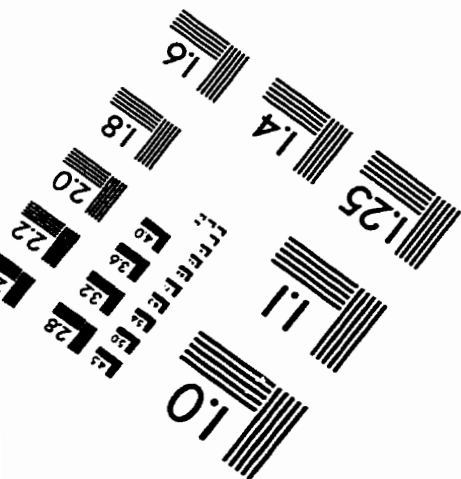
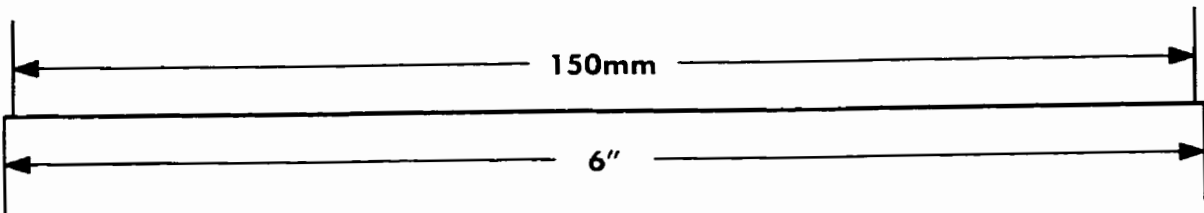
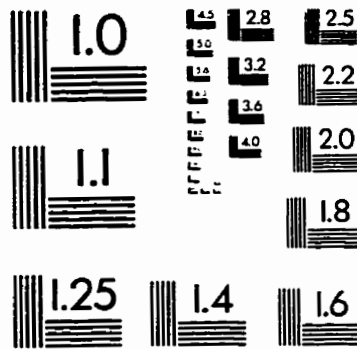
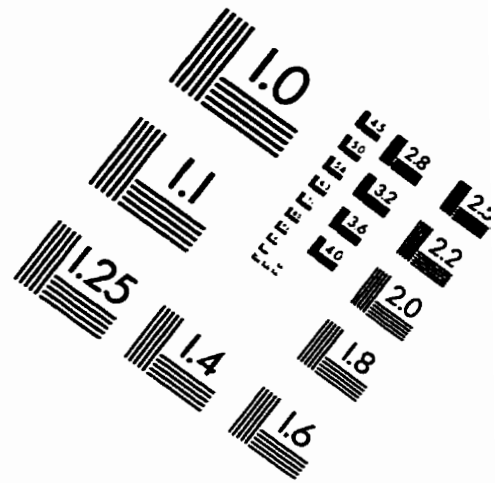
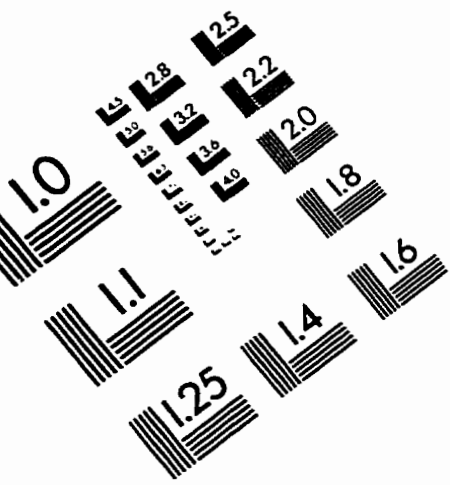
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IMAGE EVALUATION TEST TARGET (QA-3)



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