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Predicting adolescent AIDS-related risk behavior from psychosocial factors: A path analysis

Sharon M. Hays
University of Northern Iowa

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Hays, Sharon M., Ed.D.

University of Northern Iowa, 1992

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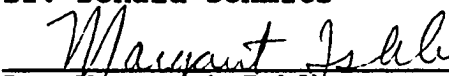
PREDICTING ADOLESCENT AIDS-RELATED RISK BEHAVIOR
FROM PSYCHOSOCIAL FACTORS:
A PATH ANALYSIS

A Dissertation
Submitted
In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Approved:



Dr. Donald Schmits



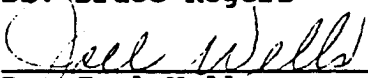
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December 1992

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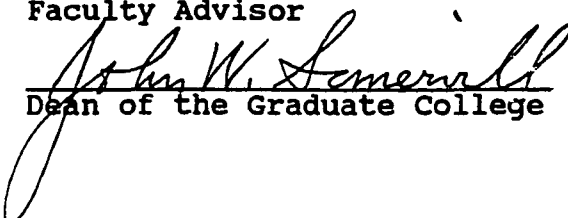
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Approved:



Faculty Advisor



Dean of the Graduate College

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University of Northern Iowa
December 1992**

ABSTRACT

This study had two purposes. The first was to develop a model for relating the unique and combined contributions of knowledge about AIDS, attitudes toward AIDS, and several psychosocial characteristics to the self-reported sexual activity of adolescents. The second purpose was to validate the proposed causal paths by studying a sample of ninth-grade adolescents and using the results of a path analysis to revise the a priori model.

The model validation study was conducted among 179 ninth-grade adolescents. A questionnaire involving knowledge, attitudinal, psychosocial characteristics, and self-report behavioral information was administered (spring, 1989). The instrument used combined a questionnaire developed by Centers for Disease Control to obtain knowledge, attitude, and behavior assessments with a questionnaire that assessed self-esteem, susceptibility to peer pressure, and locus of control which was developed by T. E. Dielman. Respondents were divided into two groups, those having had sex and those not yet sexually active.

A causal path model relating all variables to sexual activity was proposed; the model was evaluated using correlations, multiple regression, and path analysis. Multiple regression analyses failed to support further analysis of the data by gender subgroup membership. No significant differences were found in the sexual activity

between males and females; therefore, a path analysis was constructed for the combined sex group.

In the path analysis, susceptibility to peer pressure had the strongest influence on sexual behavior, followed by locus of control and perceived vulnerability. Results indicated that those adolescents who were sexually active have lower internal control, are more subject to peer pressure, and have lower self-esteem. Attitude toward AIDS, while significantly affected by knowledge, was not shown to have a significant effect on sexual activity.

The results lend support to earlier findings addressing psychosocial characteristics and adolescent drug use, which suggest that differences in these characteristics may affect individuals' health behavior more than knowledge or attitudes. A revised model based on significant findings was presented for future research and for curriculum development.

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CHAPTER I

THE PROBLEM

In a recent Gallup Poll (1988), 68% of the citizens of the United States who were polled identified Acquired Immune Deficiency Syndrome (AIDS) as the most urgent health problem facing the nation. Over one million Americans are infected with human immunodeficiency virus (HIV), with the total number of deaths caused by AIDS exceeding 126,400 (Center for Disease Control [CDC], 1991). According to the CDC (1991), AIDS will be the second leading cause of death among men 25-44 years of age and is likely to be identified as one of the five leading causes of death among women aged 15-44 years in the United States in 1991.

In Iowa, AIDS has become a leading health concern (AIDS Task Force, 1988). A vaccine to prevent transmission of the virus is not expected to be developed before the next decade, and its use would not affect the number of persons already infected by that time (CDC, 1988b).

Adolescents and HIV Infection

Although few of those afflicted with AIDS are teenagers, adolescents are considered at great risk for incurring this disease. In 1990, the incidence of AIDS increased most rapidly among persons exposed to HIV

through heterosexual contact (CDC, 1991). The percentage of adolescents (13-19 years old) who contracted AIDS by means of heterosexual contact was 14%. A significant number of teenagers engage in behaviors that increases their risk of becoming infected with human immunodeficiency virus (HIV), the virus that causes AIDS. In order to control the spread of HIV infection and AIDS, individual behaviors that either eliminate or reduce the risk of acquiring and spreading the virus must be promoted (CDC, 1988b).

HIV Transmission

Extensive epidemiological investigation has affirmed the principal means by which HIV is spread are blood, sex, and birth (Fineberg, 1988). AIDS is caused by an infection of a human retrovirus, HIV--the human immunodeficiency virus. Although AIDS is the most severe manifestation of HIV infection, HIV infection does not automatically result in the disease AIDS. However, HIV infection is associated with a number of health problems, including asymptomatic infection in which the person feels well but is able to infect others (Horan & Sherman, 1986). Intimate contact which permits an exchange of body fluids between an infected person and a person who is not infected must occur for the AIDS virus to be transmitted (Meeks & Heit, 1988).

Education as a Preventive Force

Education is currently the major weapon available to combat the spread of AIDS. Because the human immunodeficiency virus (HIV) is transmitted almost exclusively by behavior that individuals can modify (i.e., intravenous drug use and sexual activity), educational programs designed to influence relevant behavior can be effective in preventing the spread of HIV (CDC, 1988b). The Iowa legislature has joined the rapidly increasing number of states mandating AIDS education (Human Growth and Development, 1988, p. 15).

The primary objective of AIDS education is to prevent HIV infection (CDC, 1988a). Educational programs should assure that young people acquire the knowledge and skills they will need to adopt and maintain types of behavior that virtually eliminate their risk of becoming infected. It is necessary for schools to assure that students have opportunities to learn about emotional and social factors that influence types of behavior associated with HIV transmission (CDC, 1988b). While evaluations of educational interventions in sexually transmitted disease (STD) clinics suggest that special educational interventions can improve knowledge and can affect attitudes toward preventive behavior (Office of Technology Assessment [OTA], 1988), there is a paucity of

literature assessing the effectiveness of existing programs or even specific elements of them (OTA, 1988).

To prevent HIV infection among adolescents, it is necessary to be informed about the characteristics of the population to be served; to understand the prevalence of risk-taking behaviors, especially sexual activity; to identify youth at risk for such behaviors; and to institute intervention programs which will prevent or modify high-risk behaviors (Shafer, 1988). Preventive measures include the delay of sexual activity and, thus, the prevention of transmission of sexually transmitted diseases, especially AIDS. National health objectives for the year 2000 include efforts to reduce the proportion of adolescents who have engaged in sexual intercourse to $\leq 15\%$ by age 15 (CDC, 1992). To reach these objectives, the percentage of students who report ever having had sexual intercourse will have to be reduced substantially.

Factors Influencing Behaviors

Factors which influence health behaviors include socioeconomic, familial, cultural, psychological, and educational components. There is a need to focus on those factors that affect decision making in relation to high-risk behaviors. Although AIDS education and sexuality appear to increase adolescent knowledge, there

is little evidence that adolescents translate such knowledge into a reduction of risk-taking behaviors. The need to identify factors that motivate youths to adopt healthy life-styles is emphasized by the findings reported by Radius, Dielman, Becker, Rosenstock, and Horvath (1980). It was shown that, despite an expressed concern about personal health matters by young people, the practice of maladaptive health behaviors continued.

Sexual activity increases dramatically during teenage years. Rates of adolescent premarital intercourse appear to have increased with a clear and continuing rise since 1967 (Chilman, 1980). Data from national school-based surveys of students in 9th grade through 12th grade across the United States showed that in 1990, 54.2% had had sexual intercourse (CDC, 1992). Although past studies have noted differences in the sexual activity of adolescent males and females, recent studies indicate there is no difference (Diepold & Young, 1979). Increased sexual activity among teenagers makes the transmission of AIDS more likely (CDC, 1992).

According to a survey by the U.S. Department of Education (1988), drug abuse is quite widespread in school children, with over half of high school seniors having used illicit drugs. Although most intravenous drug users are between the ages of 25 to 45, more than

20,000 teenagers have used drugs intravenously. Study results of Kovach and Glickman (1986) indicated that drug use has become a normal, predictable form of behavior that accompanies adolescent development. Drug use prevalence data confirm that drug-use rates remain at alarmingly high levels and drug use begins at increasingly younger ages (Kovach & Glickman, 1986). Intravenous drug users are the second largest group of persons who have developed AIDS in the United States (OTA, 1988). Although the percentage of teenagers using intravenous drugs is small, most older intravenous drug users began their involvement with illegal substances while in their teens, even though early experiences tended to be with nonintravenous drugs (OTA, 1988).

The influence of peers is a crucial factor related to adolescent drug use. In a study of the relationship of selected variables to adolescent illicit drug use, peer behavior showed the strongest effect in the use of illicit drugs other than marijuana (Kandel, 1974). Other studies have concluded that friends' behavior is the strongest and most consistent predictor of adolescent drug behavior (Bauman, Fisher, Bryan, & Chenoweth, 1984; Jessor, Donovan, & Widmer, 1980; Kandel, Kessler, & Margulies, 1978; McAlister, Krosnick, & Milburn, 1984). Respondents in a study by Kovach and Glickman (1986)

identified peer pressure as the most difficult thing they had to face as a teenager. It seems that adolescents experience not only the pressure from friends to try drugs, but react to the added pressure arising from their perception that the great majority of their peers are involved in marijuana or other drug use.

Jessor, Jessor, and Finney (1973) showed that early sexual activity may be associated with the use of alcohol and drugs. Alcohol and drug use prior to sexual encounters have been associated with people engaging in higher risk sexual practices (OTA, 1988). Cross-sectional analyses data of the relationship between substance use and unsafe sexuality demonstrated that both alcohol and drug use of all kinds were significantly associated with increased level of risk. Those who increased their AIDS risk were more likely to subsequently report use of drugs and alcohol during sex (Becker, 1988).

Research data and theoretical perspectives of risk reduction programs point to other variables that may influence adolescent involvement in risk-taking behavior. The relationship of adolescents' conceptual systems, including self-esteem and locus of control, to health behavior has been identified as an area which needs to be investigated (Bruhn & Parcel, 1982). There are studies

of the effectiveness of sexuality education in terms of knowledge gain, attitude changes, and self-reported behavioral changes (CDC, 1988c; Jones, Ellis, Tappe, & Lindsay, 1991; Kegeles, Adler, & Irwin, 1988). Other contributing psychological factors such as self-esteem, susceptibility to peer pressure, and locus of control, however, have not been correspondingly evaluated.

The two highest risk behaviors for exposure to AIDS/HIV virus are sexual activity and intravenous (IV) drug use (CDC, 1992). It is, therefore, essential that investigations regarding the influencing factors of these behaviors be considered for the planning and implementation of AIDS education programs.

Sexual behavior is the most important determinant of risk for acquisition of sexually transmitted diseases (STDs). AIDS is the most lethal of STDs and, therefore, the one of most concern. The number of sex partners a person has influences the risk of acquiring a STD; however, the elements of transmission are more complex than a simple mathematical ratio. It was not the intent of this study to hypothesize about the degree of increased risk from more than one partner, nor to ascertain the methods of protection from transmission which respondents may have used.

Model Development

This study presents a model which attempted to partially explain the multidimensional factors involving risk behavior. Each variable was proposed as a continuum. The greater the deficiency on each of the variables and the more variables on which a deficiency exists, the higher the probability that the person would engage in sexual activity and, thus, the greater the risk of HIV infection.

The use of linear composite variables allowed for the grouping of conceptually similar survey variables and the construction of a model that summarized many of the hypothesized relationships. An explanation for the relationships presented in Figure 1 follows.

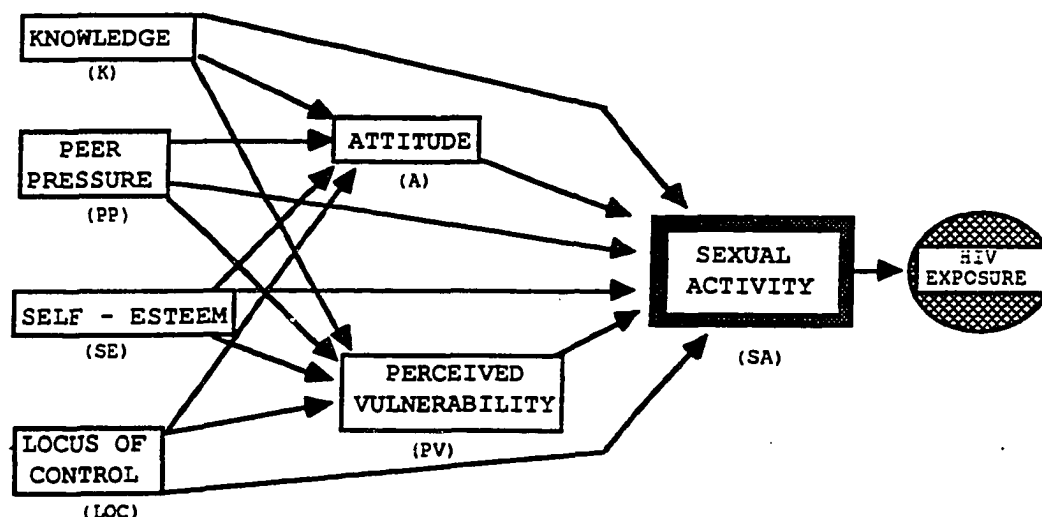


Figure 1. Path model of adolescent characteristics affecting exposure to HIV virus.

The premise of this model was that sexual activity is a function of (a) attitudes toward AIDS and (b) perceived vulnerability to AIDS. Other personality variables (i.e., knowledge, susceptibility to peer pressure, self-esteem, and locus of control) would act both independently and through attitudes toward AIDS and perceived vulnerability to AIDS, as endogenous forces determining sexual activity.

The main assumption of this model was that the most common mode of AIDS transmission to adolescents is through sexual contact (CDC, 1991). A less common route involves direct involvement of adolescents with IV drugs (CDC, 1991). Therefore, AIDS-prevention strategies involving adolescents should focus on preventing transmission through sexual contact.

Sexual Activity Component

The two main risk behaviors which can lead to exposure to the AIDS virus are sexual activity and injecting IV drugs (CDC, 1991). The number of adolescents in the ninth grade nationally estimated to have ever injected drugs is about 2% (CDC, 1988c). All cases analyzed in this study were categorized according to the extent of drug use and sexual activity. In the current study, it was found that only 2% of the sample had ever been drug users, but the number of sexually

active respondents was 48%. Thus, for the purpose of predicting behavior, this study was limited to sexual activity as the risk behavior of concern.

Attitude Component

Although definitions of attitudes vary, most definitions lead us to believe that attitudes contribute to behavior. It has been hypothesized that there are at least two aspects of sexual behavior: the behavior itself; and the attitudinal matrix in which such behavior occurs (Robinson, King, Dudley, & Clune, 1968). Health education has often been based on the premise that if an individual has understanding of, and favorable attitudes toward a particular health behavior, then the appropriate behavior patterns will eventually occur. Kilander (1970) referred to attitude as follows:

Knowing a person's attitude about something makes it possible to predict more readily his behavior or actions in relation to it. . . . Particularly in the field of sex and sexuality there are powerful conflicts between the different attitudes toward various sex behaviors and sexuality which eventually determine our individual choices of behavior. . . . Without favorable motivation through attitudes, the desirable action does not occur. . . . Studies have demonstrated that sound teaching can contribute to changes in attitudes in various areas of education. And with a change in attitude there goes a change in practice. (p. 29)

The relationship between attitudes and behavior is a complex problem. Chilman (1980) thought it probable that each affects the other. The basis for inclusion of

attitudes towards AIDS as a variable in the prediction model is logical rather than empirical. The assumption is that the more positive (open) the attitude toward AIDS (e.g., in the willingness to be near a person with AIDS), the less likely a person will be affected by fear of infection as a deterrent to sexual activity. Thus, the more positive attitude will be predictive of a higher probability of sexual activity.

Perceived Vulnerability Component

Perceived vulnerability has been a focus of studies since 1967. Beliefs about vulnerability to health problems have been viewed as important determinants to health behavior (Gochman, 1977). The health belief model is a theoretical structure developed to explain why and under what conditions people will take preventive actions (Nemcek, 1990). According to this model, the disease must be perceived as a major threat in order to effect a behavior change that would protect one from the risk of exposure to HIV infection. Other researchers have found that perceived vulnerability (susceptibility) to a disease partially determines the likelihood of an individual taking appropriate actions to avoid the disease (Becker, 1974; Weisman et al., 1989).

Evidence exists that among children and young adults perceived vulnerability can be interpreted as a

consistent personality characteristic (Gochman, 1977). Developmentally, the illusion of personal invincibility is part of an adolescent's formation of a personal identity (Bingham, 1989). Even if adolescents understand about sexually transmitted diseases, they may not feel personally vulnerable to contracting diseases (Kegeles et al., 1988).

In relating a person's perceived susceptibility (vulnerability) to risk behaviors with other health-altering consequences, it was found that perceived vulnerability to pregnancy has been positively correlated with risk-avoidance behavior (Norris, 1988). In a related study on contraceptive behavior, Eisen and Zelman (1986) observed that adolescents who saw themselves as being more susceptible to pregnancy had more knowledge about effectiveness of methods. Rosenstock (1974) believed that one's perceived threat of disease (composed of perceived susceptibility and perceived severity) is at least in part dependent on knowledge (Wyper, 1990). Knowledge has also been shown to be correlated with delayed initiation of intercourse (Norris, 1988).

Knowledge Component

"Knowledge about risk factors associated with the acquisition of HIV infection could be a significant factor in preventing the spread of disease among

adolescents" (DiClemente, Boyer, & Mills, 1987, p. 287). A study of adolescents in Massachusetts (Strunin & Hingson, 1987) indicated that many adolescents are still misinformed and confused about AIDS. Although it is obvious that the prevention of HIV transmission is dependent upon the alteration of behavior, appropriate knowledge and attitudes are prerequisites for such change (Becker & Joseph, 1988).

The consistency theory assumes that, for a health behavior to change, there must first be knowledge acquisition, leading to attitude change, culminating in behavior modification (Swanson, 1972). That is, as an individual gathers more knowledge about a subject, he develops a belief about it. He then evaluates this belief as favorable or unfavorable, forming an attitude position. Using this theory to predict behavior, the more knowledge an individual has on the sexual transmission of AIDS, the more unfavorable his attitude toward that behavior, the less likely he would be to engage in the behavior, thus attaining consistency between his attitudes and knowledge.

Peer Pressure Component

Kaplan, Johnson, Bailey, and Simon (1987) found that the perceived behavior of an individual's peers influences the level of one's own sexual activity.

Beecher (cited in Lewis & Lewis, 1984) also showed that adolescents are susceptible to peer pressure for engaging in sexual activity.

Self-Esteem Component

Low self-esteem is associated with a higher degree of risk behaviors. Dielman, Leech, Lorenger, and Horvath (1984) found that self-esteem had a significant negative relationship to all health behaviors and intentions, with the exception of the intent to drink alcohol. Children who have higher scores on self-esteem tend to practice fewer negative health behaviors and express less intention to do so in the future.

Locus of Control Component

While there is no specific evidence that locus of control will impact on students' receptivity to AIDS prevention, there is circumstantial support for such an assertion. Internal locus of control has been found to relate inversely to drug usage (Rendeiro & Brion-Meisels, 1982). Adherents to the Health Belief Model believe that an internal locus of control is necessary for individuals to be able to assume responsibility for certain types of health behavior. Many health professionals ascribe to the belief that preventive behaviors may well be consequences of internal or external beliefs. Individuals with internal beliefs are more likely to show

behaviors which promote health, since they feel responsible for what happens to them (Kist-Kline & Lipnickey, 1989). Baughman (1978) found that scores which indicated an external Health Locus of Control were correlated positively with undesirable health behavior, and that scores which indicated an internal Health Locus of Control were correlated positively with desirable health behavior.

The Model At Work

In summary, this model predicts the pathways that a variety of independent variables may take to influence sexual activity as a factor in HIV transmission in adolescents. Two variables, attitude toward AIDS and perceived vulnerability, are predicted to act directly on sexual activity. The other four independent variables (knowledge, susceptibility to peer pressure, self-esteem, and locus of control) are predicted to act directly and indirectly through both attitude toward AIDS and perceived vulnerability. The model allows for both separate and combined action by the independent variables and allows the unique and combined contributions of each to become quantified.

Statement of the Problem

AIDS is a communicable disease which, as of today, is always fatal. Adolescents are particularly vulnerable

to exposure to the HIV virus. A significant limitation of the literature is that all the known or suspected predictors of risk for HIV infection have not been considered simultaneously within an overarching theoretical framework (Kaplan et al., 1987). If patterns of sexual behavior are relevant to understanding AIDS, it is important to understand the precursors of sexual behavior. These factors may indirectly influence changes in vulnerability to HIV infection. The problem is to determine the significant contribution of each factor to sexual activity and to quantify their unique and combined effects.

Extrapolations from the Health Belief Model and conclusions from other empirical work led to the development of the causal model presented in Figure 1. Based on the assessment of the relationships between the six proposed predictive factors and sexual activity, the following hypotheses were proposed:

1. Sexual activity in adolescents, leading to exposure to the AIDS virus, is a direct function of attitude toward AIDS, perceived vulnerability, AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

2. Attitude toward AIDS, in adolescents, is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

3. Perceived vulnerability, in adolescents, is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

4. The variables AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control will have an indirect effect on sexual activity by acting directly on attitude toward AIDS and perceived vulnerability.

5. There will be no important differences in the causal model for sexual activity between genders.

Significance of the Study

To date, educational efforts have been more successful in raising awareness and increasing knowledge about AIDS than in producing sufficient changes in behaviors which reduce risk. Few systematic studies have been conducted which analyze attitudes toward AIDS, the practices of adolescents, and other correlates which contribute to risk-taking behavior.

The goal of AIDS education is to prevent HIV infection. This means changing behaviors. Knowledge about safe practices and risks may not be as important a criteria for governing behavior as are factors such as

self-esteem, peer pressure, and locus of control. It is, therefore, important to determine if the knowledge, attitudes, and practices of adolescents are correlated with personal psychosocial factors. If educators are more aware of the factors that influence adolescents choices, they can include activities in the curriculum designed to help students understand these concepts and provide the support and reinforcement needed to deter risk behaviors.

Assumptions of the Study

For the purposes of this study, the following assumptions were made:

1. Respondents clearly understood the questions. Not more than 10% of the students completing the survey were reading below a sixth-grade level (Dr. Gil Hewett, Area Education Agency 7, personal communication, April, 1989). Therefore, it was assumed that the instrument was within their ability to respond accurately.
2. The respondents completing the survey were truthful in responses regarding their behavior and beliefs.
3. The respondents selected were representative of the population.

Limitations of the Study

For purposes of this study, the following limitations were identified:

1. The study was restricted geographically to a metropolitan school district in a midwestern state, where the known incidence of AIDS was low. Therefore, judiciousness should be utilized when generalizing results to other geographical areas, since each state varies in the incidence of this health problem and the amount and degree of resources expended for prevention.

2. Although confidentiality was assured, the validity of the answers was limited to the assumption that the participants knew the correct answer, and that they gave that answer to the researcher.

3. Although evaluation and assessment of the questionnaire revealed no biases, their possible existence could not be ruled out.

4. There are many variables that influence behavior. Researchers are limited by how many can be investigated at one time. Theory suggests each of the variables chosen to be investigated in this study directly influences attitudes which, in turn, determine behavior. In choosing to study these, others were omitted that may be of equal importance.

Definition of Terms

Adolescence: the chronological years of individual growth and development beginning with the onset of puberty (about 13 years of age) and lasting more or less until maturity (about 21 years of age). The adolescent is past childhood and not yet an adult, so that the physical and psychological processes of development may be erratic or confusing and lead to difficulties in adjustment or adolescent crisis (Hawes, 1982).

AIDS: Acquired Immune Deficiency Syndrome. A viral disease that damages the body's immune system, making the infected person susceptible to a wide range of serious diseases (Quackenbush, 1988).

At Risk Behavior: potentially destructive behaviors which young people engage in with little or no understanding of the immediate or long-term consequences of their actions to themselves or others and which put the adolescent at increased risk of exposure to HIV infection, specifically sexual activity, multiple partners, and intravenous drug use.

Attitude (A): the intensity of positive or negative affect for or against a psychological object. A psychological object is any symbol, person, phrase, slogan, or idea toward which people can differ as regards positive or negative effect (Thurstone, 1946).

HIV: the accepted scientific name for the AIDS virus, the term for human immunodeficiency virus.

Knowledge (K): the aggregate of facts, information, and principles that an individual has acquired through learning and experience; formal education seeks to raise levels of knowledge systematically (Hawes, 1982).

Locus of Control (LOC): the overall degree that a person perceives that the reinforcements following his/her behavior are causally related as opposed to being controlled by forces outside or independent of self (Rotter, 1966). Individuals who expect their behavior or attributes to determine what happens to them are said to have an internal locus of control, whereas those who believe that fate, chance, or powerful outside forces determine what happens to them are said to have an external locus of control.

Peer Pressure (PP): sources of pressure and role models in the environment which act upon susceptible individuals and channel their general susceptibility for problem behaviors into specific actions (Corsini, 1984).

Perceived Vulnerability (PV): the extent to which one believes he or she is susceptible to or might encounter health problems, illnesses, or accidents (Gochman, 1977).

Self-Esteem (SE): the degree to which one feels valued, worthwhile, or competent; the internal image of oneself formed by the interaction of one's bodily experiences with influential factors in the environment at a particular stage in one's life span (Haber, 1987).

CHAPTER II

REVIEW OF LITERATURE

Acquired immune deficiency syndrome, hitherto referred to as AIDS, destroys the body's immune system, permitting normally controllable microorganisms to effectively gain a foothold in the body and cause additional, profoundly aggressive diseases that ultimately result in death. Present data indicate that 48% of patients with AIDS die within 1 year of diagnosis, and 75% are dead 2 years after the initial diagnosis (AIDS Task Force, 1988).

AIDS is forcing every school district in the nation to reevaluate its approach to sex education. Schools are faced with developing programs which are effective in not only teaching children about the disease but how to avoid it. In order to do so, educators must have a thorough understanding of the factors which influence adolescents to engage in risk behaviors known to transmit AIDS.

The literature review will follow the proposed path model in discussing literature relevant to each of the variables included in this study by the categories:

1. HIV Exposure
2. Adolescent Sexual Activity
3. Attitude

4. Perceived Vulnerability
5. Studies on AIDS Knowledge, Attitude, and Behavior
6. Self-Esteem
7. Peer Pressure
8. Locus of Control

HIV Exposure

Adolescents engage in a number of high-risk behaviors which place them at particular risk for HIV infection. Many researchers in adolescent psychology have studied the characteristics of adolescents perceived to be most vulnerable (at risk) for exposure to sexually transmitted diseases (STDs).

Early adolescence is typified by a search for independence and autonomy. In their effort to exert greater control over their lives and increased independence, adolescents may become involved with sex, alcohol, or drugs. Although some may not even want to participate in these activities, being actively involved connotes a sense of freedom from adult authority (Thornburg, 1982). Characteristics of students in Grades 10 through 12 include seeking greater independence from parents, being influenced by peer attitudes, being open to information provided by trusted adults, beginning to think about establishing more permanent relationships,

experiencing an illusion of immortality, and becoming sexually active (Brick, 1987).

A significant number of adolescents currently engage in high-risk behaviors. According to Brick (1987), over 200,000 students have used heroin; over three million have used cocaine. The same source reports that 50% of teenage women in high school have had sexual intercourse and 16% report having had four or more partners. More than 1,000,000 teenage pregnancies occur annually and one in seven teenagers currently has a sexually transmitted disease. Although data on American's sexual behavior is sparse, recent studies suggest that three fourths of all teenage girls have had sex during their teenage years, and that 15% have had four or more partners (Bryne, 1989). The number of sexual partners increases the risk of exposure to the HIV virus.

Although intravenous drug use is one way HIV is transmitted, national studies show that only 2% of the ninth-grade population in the United States is likely to have used drugs in this manner (CDC, 1988). Therefore, this review will focus on sexual activity as the risk behavior of interest.

As the literature is lacking reports of adolescent sexual behavior and the variables under study, some corollaries may be inferred from literature which

addresses the other identified risk behavior for AIDS, namely drug use. Various studies have correlated different psychosocial measures with risk behaviors, although none has examined the particular group of concepts included in this research. Since risk factors often occur together (Irwin & Millstein, 1986), investigations examining risk behaviors in varying combinations were reviewed. Studies which referred to locus of control, self-esteem, and peer pressure, singly or in combination, and which correlated them with knowledge, attitudes, and behavior were examined.

Adolescent Sexual Activity

A significant number of teenagers engage in behavior that increases their risk of becoming infected with HIV. The trends for premarital sexual intercourse for adolescent women (15-19 years of age) in the United States during 1970-1988 indicate an accelerated increase in the proportion having had premarital sex (CDC, 1991). It has been concluded by studies which examined attitudes toward sexuality that adolescents are generally becoming more accepting of sexual activity, particularly if it occurs within a committed relationship (Sorenson, 1973). Trends show that teenagers are becoming more sexually active and beginning activity at earlier ages (Byrne, 1989; CDC, 1992; Chilman, 1980; Jones et al., 1991).

In attempting to link attitudes and sexual behavior of adolescents, DeLamater and MacCorquodale (1979) in a random sampling of 985 undergraduates at the University of Wisconsin, concluded sexual standards did not differ as a function of gender, and that the double standard has disappeared. They reported a marked increase in the incidence of premarital intercourse, especially among females, which paralleled a noted movement toward permissiveness in female premarital sexual standards. These researchers also reported that fewer youth in their sample advocated abstaining from intercourse and that there appeared to be a general shift into more permissive standards, such as sex without affection.

Chilman (1980) cited several earlier studies of attitude change by Astin, Grosuch and Smith, Wright, Cox, and Yankelovich who also noted movement toward increased permissiveness regarding sexual behavior. Some studies of high school-aged populations indicated that the sexual behavior characteristic of college students is also characteristic of high school students (Chilman, 1980; Zelnik & Kantner, 1980).

Studies analyzed by Hofferth, Kahn, and Baldwin (1987) showed a substantial increase between 1971 and 1979 in the sexual activity of both black and white teenagers, with women becoming sexually active at

increasingly younger ages and fewer teenagers marrying. More young teenagers, especially under age 16, are becoming sexually active. In 1982, an estimated 44.9% of all 15-19 year-olds living in metropolitan areas had ever had premarital intercourse, according to the National Survey of Family Growth (Hofferth et al., 1987). This analysis was obtained from retrospective reports of first sexual intercourse and was comparable to estimates generated from vital statistics. In analyzing interviews with 8450 adolescent women (15-19 years of age) which occurred over 4 years, the studies showed a substantial increase (from 30.4% in 1971 to 49.8% in 1979) in sexual activity (primarily nonmarital) of teenagers in metropolitan areas. Only 23% of females under age 15 at first intercourse, compared with 53% of those aged 18-19, started using a contraceptive method within the first month after sexual debut; 42% delayed contraceptive use for more than a year, compared with those aged 18-19.

In a study on sexual and contraceptive knowledge, attitudes, and behavior of male adolescents, Finkel and Finkel (1975) found that the mean age at first coitus for the sexually experienced males was 12.8; and, at last intercourse 55% of the males used no contraceptive. Payton (1988) sampled a midwestern public high school and found over two-thirds (66.8%) of the sample had sexual

intercourse at least once, and 26.1% indicated they engaged in sexual relations four or more times a month. A larger percentage of the females (39% versus 29% of males) said they had never had sexual intercourse. In this study, the mean age at first intercourse was 14.88 years. The mean for females (14.902) was slightly higher than that for males (14.868).

A UCLA researcher (Grunwald, cited in Payton, 1988) collected data from adolescents in five states and found that 43% of the boys and 31% of the girls, ages 15 and 16, have had intercourse. Of this same group, 28% of boys and 7% of the girls reported having had 10 or more partners. He concluded that adolescent chastity is no longer a widely held behavioral norm.

Reported AIDS cases associated with heterosexual transmission of human immunodeficiency virus have been increasing steadily, with cases occurring more frequently among women than among men (CDC, 1991). This adolescent group is at high risk both for conception and for exposure to AIDS because of their slow adoption of contraception after first intercourse (Dawson, 1989).

Attitude

Gallup Polls on attitudes regarding premarital sex taken in 1969 and in 1985 showed the percentage of Americans who viewed premarital sex as wrong dropped a

remarkable 29 percentage points, from 68% to 39%. A survey done in 1987, however, showed that 46% were saying that sex before marriage is wrong. About the same number, 48%, believe it is not wrong. A reversal in the trend since 1969 toward acceptance of premarital sex may be due to a growing concern over the risk of diseases such as herpes or AIDS (Gallup, 1988).

Although there is frequently a statistical relationship between the expressed attitude and the associated behavior, a study of 3,500 junior and senior high school students (Zabin, Hirsch, Smith, & Hardy, 1984) concluded that, while the majority of young people already have values and attitudes consistent with responsible sexual conduct, it would appear that there are large numbers who are unable to translate these attitudes into personal behavior.

It has long been noted that knowledge in itself is not enough to change behavior. Attitudes about a topic have been held to be even more relevant in governing behavior than knowledge about a subject. When McKusick (cited in Valdiserri et al., 1987) surveyed 655 homosexual men in San Francisco, they found that although men "were uniformly well-informed about the prescribed behavior for AIDS risk reduction" (p. 494), many

displayed discrepancies between what they believed and their reported sexual behavior.

Zabin et al. (1984) concluded that, for teenagers to be part of a small minority that resists a permissive norm, they must hold attitudes distinctly different from those held by most of their social group. The researchers could not conclude whether attitudes shape behavior or behavior shapes attitudes, but they interpreted some of the obvious attitude-behavior inconsistencies as reflective of normative responses to the influences of peers, family, community, and media.

Perceived Vulnerability

An individual's perceived susceptibility (vulnerability) or perceived personal risk of disease is considered to be an important determinant of taking preventive action to avoid the disease (Weisman, 1989). Children's perceived vulnerability has been the subject of a series of studies since 1967 (Gochman, 1977). Rosenstock (1974) incorporated the concept of perceived vulnerability, along with health salience and motivation, as components of a Health Belief Model. Theoretical developments of the model have produced evidence that, among a set of three predictors, perceived vulnerability had the best positive relationship with intention to take health action and that the predictive value of perceived

vulnerability is enhanced among persons who have high levels of health motivation (Gochman, 1977).

Although teenagers are at risk of becoming infected as they become sexually active, most teenagers do not believe that they are likely to become infected (CDC, 1988c; Kolbe & Jones, 1988; Taylor-Nicholson, Wang, & Adame, 1989). As concrete operational thinking changes to abstract, hypothetical reasoning, many adolescents have difficulty separating actual cause and effect relationships from perceived ones. This difficulty, coupled with the tendency to think of themselves as being invincible, may contribute to young people's feelings of invulnerability to personal risk (Irwin & Millstein, 1986). Evidence of this has been demonstrated in a studies which revealed that a high proportion of adolescents are not worried about contracting the disease (Price et al., 1988; Strunin & Hingson, 1987).

Adolescents are at great risk of being infected with the AIDS virus because of their sexual activity and, therefore, are in need of education to avoid opportunities for transmission. The National Academy of Sciences and the Institute of Medicine's comprehensive report (1986) on AIDS states that "for at least the next several years, the most effective measure for significantly reducing the spread of HIV infection is

education of the public, especially those individuals at higher risk" (p. 48). In particular, "special educational efforts must be addressed to teenagers who are often beginning sexual activity, and also may experiment with illicit drugs" (p. 48). A sense of personal vulnerability would make the available knowledge concerning transmission and prevention salient (Becker & Joseph, 1988).

Sexual practices and drug use are biologically based, socially complex behaviors. Both derive from biological impulses that are hard to resist. "Lacking perceived vulnerability, a person is unlikely to change customary habits and behaviors, especially ones that are biologically driven" (Fineberg, 1988, p. 593). Young adults tend to think of themselves as invincible, which leads them to indiscriminate sexual behavior. This increases their risk of contracting AIDS (Price et al., 1988).

In a study involving teenagers attending a family planning clinic, McGill, Smith, and Johnson (1989) found that the serious nature of AIDS and HIV infection was well understood. A large majority (87%) indicated fear of getting AIDS, while 49% indicated they were not likely to get AIDS. Weisman et al. (1989) concluded that slightly more than half of the 404 sexually active

adolescent women they studied reported some degree of perceived risk that they could get AIDS.

Studies of AIDS Knowledge, Attitudes, and Behavior

Although ambiguity surrounds the question of effective sexuality education in the United States, the association of knowledge, attitudes, and practices has long been queried. Significant increases in knowledge have occurred following AIDS education programs. However, available data suggest that teenagers have initiated little behavioral change in response to AIDS (OTA, 1988).

Although most states have passed legislation requiring AIDS education in schools, many adolescents do not know what sexual and drug precautions are needed to prevent transmission of the virus (DiClemente et al., 1987; OTA, 1988). The CDC's Center for Health Promotion and Education, Office of School Health and Special Projects, has provided funding to study the effectiveness of school-based AIDS educational programs in changing student risk behaviors. The questionnaire used in the first part of this survey has been used by many states' departments of education to assess HIV-related beliefs and knowledge and behaviors associated with HIV transmission. In 1988, baseline data were collected from samples of students in Grades 9-12 in six large cities

and in nine states. Sample sizes varied from 778 to 7013 students. Knowledge about AIDS varied greatly among sites. The range of students who knew that AIDS is not transmitted through giving blood varied from 27.8% to 53.3%. A range of 93.8% to 98.4% of students knew that AIDS is transmitted by sharing needles, and 88.3% to 98.1% knew that AIDS is transmitted through sexual intercourse. Rates for ever injecting intravenous drugs varied from 2.8% to 6.3%. Rates of sexual intercourse also varied, with from 28.6% to 76.4% reporting having had sexual intercourse at least once. At every site, more male than female students and more older than younger students reported three or more sex partners.

In summarizing the effectiveness of specific educational interventions, the Office of Technology Assessment (1988) found several studies which demonstrated that adolescents are quite knowledgeable about AIDS (particularly about modes of transmission). OTA found little data to suggest that teenagers have initiated any behavioral change in response to knowledge of AIDS transmission.

Several studies (McGill, 1989; Price et al., 1988; Strunin & Hingson, 1987) have demonstrated that adolescents are quite knowledgeable about the fact that vaginal and anal intercourse with an infected partner can

transmit AIDS. However, a survey conducted in San Francisco showed that while 92% of the students knew that sexual intercourse was one mode of contracting AIDS, only 60% were aware that using a condom during intercourse may lower the risk of getting disease (DiClemente et al., 1987).

In a study of 250 high school students, few had accurate information about AIDS or were concerned about their risk of getting AIDS (Price, Desmond, & Kukulka, 1985). In a random survey of 860 adolescents sampled in Massachusetts, Strunin and Hingson (1987) found that of the 15% of sexually active respondents who reported changing their sexual behavior out of concern for contracting AIDS, only 20% used effective methods.

In a study of AIDS/HIV knowledge and sexual behavior among students from 122 high schools (drawn from a sampling frame of all high schools in the United States) nearly all the students knew the two main modes of HIV transmission (Anderson et al., 1990). Students who knew more about HIV transmission were less likely to report having had two or more sexual partners and more likely to report consistent condom use. The level of knowledge was found to significantly affect the risk behaviors of sex with multiple partners and sex without condom usage (Anderson et al., 1990). The researchers concluded that

HIV/AIDS education may have an effect on risk behaviors by increasing relevant knowledge.

Adolescent surveys differed from surveys of college students in their perceived vulnerability. When similar surveys about AIDS were conducted among college students, a much greater degree of worry was found than Strunin and Hingson (1987) found among high school students. Dorman and Rienzo (1988) found 55% of University students in their sample to be very worried and 34% were extremely worried about AIDS. Only 15% of the adolescent respondents in the Strunin and Hingson (1987) sample indicated that fear of contracting AIDS had influenced changes in their sexual behavior.

Data collected from 2,307 students in Grades 9-11 led researchers to conclude that many (34-64%) were sexually active, 34% were active with more than one partner, and that more males than females were likely to be sexually active (Jones, Ellis, Tappe, & Lindsay, 1991). They also found that they were fairly knowledgeable in ways AIDS is transmitted sexually and intravenously, but had misconceptions about transmission from insect bites, the safety of the blood supply, and where to get tested for HIV. Males were less supportive than females of allowing HIV positive students to attend school or allowed in the same class. These numbers are

very close to data reported in other statewide studies (CDC, 1988c).

Jaccard (1975), in analyzing factors important to health education strategies, identified exposure to new information as a factor which can influence whether or not a person's intentions correspond to his behavior. The percentage of respondents from high schools across the nation overwhelmingly believe schools have a responsibility to teach about HIV/AIDS (CDC, 1988c).

Peer Pressure

The literature has not been in agreement concerning which reference group has the most influence on the adolescent. In a survey of the relative importance of parents and friends in adolescent decision making, Wilks (1986) found that parents were perceived as most important in certain future-oriented areas but, for current decisions, friends' opinions were more valued.

One of the characteristics of adolescence is that the significant other person shifts from parent to peer (Erikson, 1968). As adolescents become increasingly aware of their own selves and relationships to peers, their allegiance and affiliation shifts away from parents and teachers toward the peer group. Peers become the prime source for standards and models of behavior (Bondi & Wiles, 1981).

Reference group theory suggests that human behavior is shaped by, and can be predicted from, an individual's interactions with those persons whose opinions, and influences are salient and with whom the individual identifies (Stone et al., 1979). A study by Stone et al. (1979) demonstrated that the influence of the most salient reference group (i.e., parents or peers) is a good indicator of the behavior of the individual concerning marijuana use. Subjects tend to behave consistently with the normative expectations of the most influential reference group.

The initiation of drug use by adolescents is known to be strongly influenced by peer and adult models. As adolescence progresses, self-use of marijuana and other drugs appears to become increasingly consistent with perceptions of peer use, whereas adult models become relatively less important (Huba & Bentler, 1980). It is possible the increasing relationship between self-use and perceived peer use represents the young user's effort to justify drug use by believing that friends also use the drug. "It probably also represents the greater susceptibility to peer influence of youths making the transition from junior high to senior high school" (Huba & Bentler, 1980, p. 453). In Kovach and Glickman (1986), over one-third of the sample said they used drugs because

their friends used them. Other data indicate that the single best predictor of becoming sexually active within the next year is the proximity of a sexually active best friend (Irwin & Millstein, 1986).

Jessor and Jessor (1977) suggested that problem behaviors, including drug and alcohol use, permissive sexuality, and other actions associated with deviance are due to the interaction of three sets of variables: personality, the environment, and other behaviors. Those factors which contribute to their development are the presence of, and social pressure from, peers who model these problem behaviors. Jessor viewed the sources of pressure and role models in the environment as acting upon susceptible individuals and channeling their general susceptibility to problem behaviors into specific actions.

In early adolescence, increased identification with the peer group serves to fulfill needs for separation from parents. At the same time, this identification may provide increased pressure to take risks. The role of peer pressure in adolescent risk taking has been well-established. Recent research on the effects of peer pressure and vulnerability to risk taking in 10-14 year olds confirmed the nature of the risks (Lewis & Lewis, 1984). Risk taking in middle and late adolescence serves

to fulfill developmental needs related to autonomy as well as needs for mastery and individuation.

In a study by Lewis and Lewis (1984) which sampled 771 children in Grades 5-8 (representing the entire population in a Southern California school district's subdivision), the children said they were dared by peers to engage in problem behaviors more frequently as age/grade increased. (This included all of the problem behaviors defined by Jessor, as well as dares for activities which risked personal injury). Peer pressure was reported most frequently by eighth-grade students. Among seventh and eighth graders, more boys were dared to perform acts of violence, and more girls were challenged to be sexually active. According to the data from this survey, children indicated they are presented with challenges to place themselves at risk at an age before being capable of understanding causal relationships between an act and the nonreversibility of its consequences. In examining peer pressure to engage in sexual activity, they found that 16.4% of seventh- and eighth-grade girls were challenged and dared to become sexually active.

Erikson (1968) viewed dares, an example of peer pressure, as part of a normal developmental process, a means of clarifying group values and group memberships.

Peer pressures can be regarded as stimuli for actions which affirm and strengthen an individual's affiliations with certain groups and help them develop an identity by becoming aware of the existence of subcultures and their normative beliefs. Occasionally, in the process, it leads some to adopt behaviors which are harmful to their own health. Thus, peer pressure has been defined both as a part of the normal process of psychological development and a major contributor to the development of risk-taking behaviors (Erikson, cited in Jessor & Jessor, 1977).

In a study examining the extent and effects of peer pressure among high school students, Brown (1982) found that 35% of the respondents, males and females, identified peer pressure as the most difficult thing they had to face as a teenager. Peer pressure appeared to be a more influential feature of high school life for girls than for boys. The pressures reported by female respondents were comparatively more intense, more strongly interconnected, and more clearly related to the teenager's behavior and attitudes. Only with regard to having sexual intercourse did males report higher peer pressure than females, although this difference was not statistically significant. Controlling for the effects of both gender and attitudes toward premarital intercourse, respondents who had engaged in sex in high

school (approximately half the sample) reported significantly greater pressure from peers than those who had remained virgins. Perceptions of peer pressure were significantly associated with dating attitudes, sexual activity, and use of drugs and alcohol (Brown, 1982).

A number of studies provide evidence that males are more heavily influenced by peers than females in sex behavior, with strong pressures frequently being experienced by males to have intercourse (Chilman, 1980). Mirande (1968) found that males, but not females, received peer pressure to have premarital intercourse. Fitzpatrick (cited in Calabrese, 1985) found that females rely more heavily on peer approval than males.

Some studies have shown a positive correlation between having sexually permissive friends and being sexually active and have concluded that peers strongly influence sexual behavior (Carns, 1973; Jackson & Potkay, 1973; Mirande, 1968; Spanier, 1975). However, Costanzo and Shaw (1966) felt that peer compliance may be as likely due to adolescents' willingness to conform to group norms and attitudes, particularly during the early teenage years, as to peer pressure. Additionally, sexually active young people may be drawn to friends who have similar attitudes and behaviors. For example,

Mirande (1968) found that sexually experienced females were more likely to associate with similar peers.

Peer pressure is commonly cited by teens as an influential factor which encourages adolescents to become sexually active (Zelnik, 1981). They reported that teens look to their families for guidance in the areas of education, career selection, and money management; however, friends' opinions are more important in determining decisions about sexual behavior. Norms of a given cultural group help determine the level of sexual activity of members of that group. The expectations of the group may modify the adolescent's behavior to conform with what appears more socially desirable.

Self-Esteem

Assumptions have been made about the relationship between self-esteem and behavior. Satir (1975) wrote, "A belief basic to my work through the years has been that people function according to their feelings of self-worth or value" (p. 10).

A sense of belonging is important in building self-esteem. The need to be socially accepted is important, especially during adolescence. A feeling of warmth and caring can be conveyed through physical contact. Touching conveys a feeling of care and concern that words cannot adequately express. Corsini (1984) affirmed that

love, warmth, and acceptance have been demonstrated to be extremely important in terms of developing a high degree of self-esteem. Efforts to achieve a sense of belonging may lead to drug and alcohol abuse in those whose emotional needs have not been met in their families (Reasoner, 1983).

Miller (cited in Chilman, 1980) found, in his study of sexually active girls, that low self-esteem generally leads to anxiety about self. One way to assuage this anxiety is to seek self-confirmation through a love-sex relationship. Douvan and Adelson (cited in Chilman, 1980) found that adolescent girls become deeply involved in their love-sex relationships. Their sense of self-esteem and their needs for reassurance and love are closely linked.

In a study by Petersen-Martin and Cottrell (1987), the relationship between health behavior and self-concept was examined and a positive correlation was found. Self-concept could explain 8.4% of the variance of health behavior.

Coopersmith (1967) analyzed many studies which examined self-esteem. He concluded that a person with low self-esteem is less capable of resisting pressure to conform and is less able to perceive threatening stimuli. Studies reported by Coopersmith indicated that a person

with high self-esteem maintains a fairly constant image of his/her capabilities and of his/her distinctness as a person. It is also likely that persons who regard themselves negatively will be inclined to be intropunitive and passive in adapting to environmental demands and pressures. Those who place a higher value upon themselves will adopt a more active and assertive position (Coopersmith, 1967).

Mead (1934) studied the process whereby the individual internalizes the ideas and attitudes expressed by the key figures in his/her life, observing their actions and attitudes, adopting them (often unknowingly), and expressing them as his/her own. From his work, it can be concluded that self-esteem is largely derived from the reflected appraisal of others. "No matter how isolated and independent he may believe himself to be, he carries within himself the reflecting mirror of his social group" (Mead, 1934, p. 54).

Various studies have undertaken to define the relationship between self-esteem and feelings toward parents and peers. Walker and Greene (1986) found that the quality of relationships with parents made significant contributions to self-esteem in both boys and girls, while the quality of peer relationships made a significant contribution only for girls but not boys.

Given the increasing importance of peer relationships in adolescence, one would expect relationships with peers to be predictive of self-esteem. O'Donnell (1976) also reported finding a stronger relationship between self-esteem and feelings toward peers for girls than for boys. Greenberg, Siegel, and Leitch (1983) found that the influence of parental relationships on self-esteem did not diminish from early to late adolescence. The quality of the attachment to parents was related to self-esteem, regardless of the age of the adolescent.

Health Locus of Control

Locus of control has been studied to better understand many behaviors (James, Woodruff, & Werner, 1965; Plumb, D'Amada, & Taintor, 1975). Studies using health locus of control have used the concept to interpret motives for health preventive behaviors (Dielman et al., 1984; Dielman et al., 1987; Kist-Kline & Lipnickey, 1989). Health locus of control measures the extent to which individuals perceive themselves to be in control of their own personal health (Kist-Kline & Lipnickey, 1989). Health Locus of Control beliefs are thought to influence personal decisions to change lifestyles. Those with an internal locus of control, who believe that outcomes depend upon their behavior, are

more likely to take action to improve their health (Miott & Miott, 1975).

Personality variables, such as perception of locus of control, probably mediate the behavioral effects of educational programs (Valdiserri et al., 1988). In a study of incarcerated drug abusers, Valdiserri et al. (1988) found a difference in locus control in those who adopted practices that would lower their risk of infection. Those who practiced incomplete risk reduction were found to have a more internal locus of control, contrary to expectations. It was hypothesized that those with an internal locus of control would be the most likely to modify behaviors in an attempt to control health outcomes. The difference between those who practiced maximal and those who practiced minimal risk reduction behaviors in their perception of locus of control suggests that the study of personality variables may enhance educators' ability to promote desired preventive practices. Previous behavioral evidence of self-control in health-related matters, such as having successfully stopped smoking, was a good predictor of current AIDS reduction behavior, according to Valdiserri, et al. (1988).

In a study of the relationship between locus of control, perceived susceptibility to illness, and

benefits of preventive actions, Kirscht (cited in Nemcek, 1990) found that internally controlled respondents viewed themselves as less susceptible to illness. Internally controlled respondents also identified preventive measures as more beneficial than did externally controlled persons.

In a review and analysis of literature on health locus of control, Kist-Kline and Lipnickey (1989) found positive correlations between self-image and internal locus of control, education, and seeking health information. They concluded that, while health locus of control is an important factor in determining the likelihood of adopting preventive health behaviors, merely possessing an internal locus of control may not be enough to change behaviors. Thus, assessment of the many dimensions relating to health locus of control possibly could lead to more accurate predictions of preventive health habits.

Dielman et al. (1987) was the only study found which examined the concepts of susceptibility to peer pressure, self-esteem, and locus of control simultaneously. They developed the survey used as part of this study to examine these concepts in a group of over 2,500 children in Grades 5 through 8. Each of the factors had a direct influence on health behavior.

Summary

The sexual activity of adolescents has been studied by various researchers, as have the independent variables proposed for consideration in the present model. Sexual activity is a behavior that puts adolescents at risk for exposure to the HIV virus (CDC, 1988b; McGill et al., 1989). It is occurring at increasingly earlier ages, with multiple partners, and without protection from viral transmission (Byrne, 1989; CDC, 1991; Chilman, 1980).

The attitudes one has toward a disease can influence behavior leading to prevention (Becker & Joseph, 1988; Swanson, 1972). The relationship between attitudes and sexual activity has shown increasing permissiveness toward premarital sex (Byrne, 1989; Chilman, 1980). The attitudes toward AIDS and persons with AIDS have been investigated and were generally found to be favorable among adolescents, indicating a lack of fear (Kolbe & Jones, 1988; Taylor-Nicholson, Wang, & Adame, 1989).

Beliefs about vulnerability to health problems have been viewed as important determinants of health behavior (Gochman, 1977). Studies have shown that consistent lack of perceived vulnerability among adolescents has been associated with higher degree of risk behaviors (Nemcek, 1990; Price, Desmond, & Kulkulka, 1985).

Correlations have been observed which relate risk behaviors to personality characteristics of adolescents. The relationship of knowledge, attitudes, and behavior has been argued with conflicting results. Knowledge has often been thought to influence attitudes. Whether or not knowledge influences behavior change is debated (Fineberg, 1988; McGill et al., 1989; Price et al., 1988; Strunin & Hingson, 1987). Peer pressure has been found to influence sexual activity, risk behaviors, and attitudes toward prevention, according to the standards of the normative group (Brown, 1982; Kaplan et al., 1987). Peers are the prime source for standards and models of behavior for adolescents (Bondi & Wiles, 1981). Self-esteem can affect attitudes, health behaviors, and interpersonal relationships positively or negatively (Corsini, 1984). Low self-esteem is associated with a higher degree of risk behaviors (Norem-Hebeisen, 1975; Stanwyck, 1983). Each of the variables of attitudes, knowledge, peer pressure, self-esteem, and locus of control has been shown to have an effect on adolescent risk behaviors, whether they are considered independently or in combination with other variables.

The dominant research method found in the literature reviewed has been to isolate from one to three independent variables and to determine their effect on

HIV infection risk behavior. There is a need to focus on the unique and combined effects of known significant independent variables in a single study. Such a multivariate approach should more directly support curriculum development in AIDS prevention education.

CHAPTER III

METHODOLOGY

This study was designed to investigate the relationship between psychosocial characteristics of ninth-grade adolescents and sexual activity which puts them at high risk for exposure to the AIDS virus. Specifically, the study was designed to:

1. Measure the present level of seven variables: (a) knowledge, (b) attitudes, and (c) sexual practices relating to AIDS; and the measures of (d) susceptibility to peer pressure, (e) self-esteem, (f) health locus of control, and (g) perceived vulnerability.
2. Determine if gender-related differences exist among the seven variables.
3. Determine the degree of causal relationships between psychosocial measures and the knowledge of AIDS, attitudes toward AIDS, and sexual activity.

The procedures involved in conducting this research study are described in this chapter. The chapter is divided into four major areas: (a) subjects, (b) instruments, (c) procedures, and (d) data analysis.

Subjects

A recurring theme in current literature is that adolescents, by nature of their developmental

characteristic of risk-taking behavior, are the population most likely to become infected with the AIDS virus. It was, therefore, decided to select a sample representative of an adolescent population from a metropolitan school district of a midwestern state.

The subjects for the study were from nine sections of a group of ninth-grade students attending one of two public high schools in a metropolitan midwestern community. The subjects for the study were enrolled in physical education classes which offered the course, "It's Your Choice" (Waterloo Public Schools, 1987). The survey administration was appropriate as a measure of pre- and postcourse objectives on health-related behaviors. Each section was comprised of approximately 25 students. These sections were combined into one unit for analysis.

The majority of the residents of the community studied are relatively well-educated and would probably be classified as being members of the middle socioeconomic class. The median household effective buying income in the school district studied was \$27,557 (Vogl, 1988). The students reading ability averaged at the 54th percentile, the average grade equivalent was 8.38 (Dr. Gil Hewett, Area Education Agency 7, personal communication, April, 1989).

The sample was homogeneous, except for gender. The sex distribution was 44% female and 56% male (compared to 47.5% females and 52.5% males in the total school population). The school district had a minority population of 21.4%; however, racial membership was not queried in the study. Although participation in the survey was entirely voluntary, the characteristics of the sample population are believed to be similar to the general population in the two schools involved in the study.

Instruments

The sample was surveyed by means of a questionnaire designed by the Centers for Disease Control (CDC) (see Appendix A) and the Susceptibility to Peer Pressure, Self-Esteem and Health Locus of Control questionnaire developed by T. E. Dielman (see Appendix B). These were combined into one continuous instrument (see Appendix C). Permission to use the questions was granted by T. E. Dielman (personal communication, February 10, 1989) and Laura Kann (personal communication, February 10, 1989).

The CDC questionnaire was collaboratively developed, for use by adolescents in Grades 9 through 12, by representatives in HIV education from all state education agencies, 16 local education agencies, and scientists from the Centers for Disease Control. The newly revised

version was field-tested by the Michigan, Minnesota, and Rhode Island education agencies during fall, 1988. An earlier version of the questionnaire was used in at least nine states. Part 1 of the questionnaire is concerned with attitudes toward AIDS, Part 2 with knowledge, and Part 3 with risk behaviors, for a total of 49 questions.

A factor analysis was not done on the revised survey. Findings from an earlier one showed that a factor analysis does not clump the questions (Laura Kann, personal communication, February 10, 1989). It was developed as a surveillance instrument, not a scale, that being the primary difference in the use of it for public health versus education. Results of the revised version were reported in the December 2, 1988 Morbidity and Mortality Weekly Report.

The demographic portion of the questionnaire included questions regarding the amount of formal AIDS education, major source of sex information, sex, and completion of the course, "It's Your Choice." The questions on Susceptibility to Peer Pressure, Self-Esteem, and Health Locus of Control developed by T. E. Dielman (see Appendix B) were administered to 2,589 fifth- and sixth-grade students as part of a school-based alcohol misuse prevention study supported by the National Institute on Alcohol Abuse and Alcoholism. It contained

20 items on children's health locus of control adapted from Parcel and Meyer (cited in Dielman et al., 1987) and 17 children's self-esteem items adapted from those reported by Coopersmith (cited in Dielman et al., 1987). The eight items to assess susceptibility to peer pressure were created from items originally designed to measure "tolerance of deviance" in a study by Rachel et al. (cited in Dielman et al., 1987), two from a study by Davies and Stacey (cited in Dielman et al., 1987), and two constructed by Dielman et al. (1987). The questionnaire items reflecting susceptibility to peer pressure, self-esteem, and health locus of control were factor analyzed. Based upon these results, the indices of susceptibility to peer pressure, self-esteem, and health locus of control were used in this study. Details of these factor analytic procedures, index construction, and item content are discussed in Dielman et al., (1987).

When the proposal was presented to the school district administration, they requested that the responses for the psychosocial factors be changed from a yes/no format to a Likert format. It was further suggested that the section from the CDC questionnaire regarding friends' behavior be deleted. These suggestions were incorporated into the survey instrument. A pilot study was conducted with a sample of ninth-grade

students prior to distributing the instrument to the sample selected for this study.

Procedures

Ethical considerations of this study primarily involved the protection of the participants' privacy and anonymity. Participation in the survey was completely voluntary and totally anonymous. Anonymity was assured by the absence of identification on the test sheets, either by name or by code. The research was conducted according to the guidelines established by the Human Subjects Review System, University of Northern Iowa. The classes participating in this survey were taught by nine teachers. Instructions were given at a staff meeting to all teachers prior to administering the survey.

A letter explaining the survey and request for parental permission (see Appendix D) was sent home with the participating students 2 weeks before testing. No student was tested without the parent's signed permission. The survey was available for parental inspection at the participating schools 1 week prior to testing. Sample sizes were determined by the number of parental permission slips returned.

In March, 1989, surveys and electronic data sheets were taken to the selected school by the investigator and administered to the students during their regularly

scheduled class periods by the physical education teachers. The teachers read the instructions on the face sheet of the instrument (Appendix C) to the students after handing out the survey. One hundred and eighty-five questionnaires were administered to seven ninth-grade classes. After completing the questionnaire, the respondents returned them to a collection box designated by the classroom teacher. The instruments and the answer sheets were collected from the schools at a later time, and the data were entered onto a computer disk for statistical analysis. A total of 179 usable questionnaires were obtained.

Preanalysis of Data Considerations

An assumption was made that the relationship between the variables was linear and additive. Each variable (with the exceptions of perceived vulnerability and sexual activity) was proposed as a continuum. The greater the deficiency on each of the variables and the more variables on which a deficiency exists, the higher the probability that the person would engage in sexual activity and, thus, the greater the risk of HIV infection. The use of linear composite variables allowed for the grouping of conceptually similar survey variables and the construction of a model that summarized many of the hypothesized relationships.

The scores for the variables attitude, knowledge, susceptibility to peer pressure, self-esteem, and locus of control were summed and the means were used. If a participant did not respond to two or more questions within a category, the mean index in that category for the participant was not calculated. If a participant responded to all but one of the statements within a category, the mean index for that respondent was adjusted to reflect the number answered.

All cases were categorized according to the extent of drug use and sexual activity. Respondents who had used neither drugs nor alcohol in the past year were designated as nonusers. Those who had varying degrees of sexual activity were grouped together into one category, sexually active; the second category was those who had never had sexual intercourse. It should be noted that some participants failed to respond to selected items, thus totals vary on some questions. The two main risk behaviors which lead to exposure to the AIDS virus are sexual intercourse and injecting IV drugs. The number of adolescents in the ninth grade nationally estimated to have ever injected drugs is about 2% (CDC, 1989). In this study, it was found that only 2% of the sample had ever been drug users; however, the number of sexually active respondents was 48%. Thus, for purpose of

predicting behavior, this study was limited to sexual activity as the risk behavior of concern.

Data Analysis

Instruments were collected from the schools and the data were entered onto a computer disk for statistical analysis. A total of 179 usable questionnaires were analyzed. Path analysis was used for testing the model. Multiple regressions were computed on each of the variables shown in the model. Correlations were analyzed using zero-order Pearson product moment correlations.

The knowledge score was obtained from 20 items-- questions 8, 9, 10, and 13 through 29. Knowledge is identified as the number answered correctly on knowledge questions. The answers "not sure" and "no" were grouped together for dichotomy and were considered incorrect responses.

The attitude toward AIDS score was derived from questions 5, 6, 7, 11, 12, and 39. These questions were dispersed among knowledge items to avoid an attitudinal response pattern. Sexual behavior was defined primarily in terms of the response indicated on the first sexuality question, which asked about the number of sexual partners.

Susceptibility to Peer Pressure scores were derived from eight questions, numbers 41-48. Higher scores were indicative of greater susceptibility to peer pressure.

Self-esteem scores were derived from questions 49 through 65, for a total of 17 questions. The higher scores on the Likert scale reflected a higher self-esteem.

Locus of control scores were drawn from 14 questions, numbers 66 through 79. The higher score reflected a stronger internal locus of control.

Perceived vulnerability scores were based on a one-item, 4-point Likert scale (question number 40) which asked, "What do you consider your risk is for being infected with the AIDS/HIV virus?" Although one-item scale can be problematic, for this exploratory study it was deemed sufficient. The concept being measured was straightforward and not as complex as the other variables.

To determine if there was a category of high-risk individuals, questions 30, 31, 32, 33, 44, 35, and 37 were grouped for analysis. These questions dealt with risk activities of IV drug use, needle sharing, number of sexual partners, and condom usage. Since no respondents fit in this category, it was not included in the analysis.

A path analysis model was employed to investigate the combination of characteristics which would be associated with sexual activity. The variables were selected based on accepted theories of adolescent behavior, social learning behavior, and health belief model. These provided sufficient theoretical support to suggest that all of the predictor variables are related to sexual activity, thereby making it possible to propose an a priori predictor model.

In path analysis causal assumptions are incorporated into a set of multiple regression equations and the coefficients are estimated in the usual way. These coefficients give numerical values to the direct effects of selected causal variables on each of a series of dependent variables, and indirect effects can be readily obtained from the complete set of direct effects. The explicit statement of assumptions about the causal structure underlying a set of observed correlations is known as a causal model. The path model states not only the causal offering of the variables, but also the analyst's assumptions about the direct and indirect paths by which one variable has an effect on another. The assumptions about causal structure, the path model may be expressed either in the form of a set of equations or in the form of a corresponding path diagram. (Mueller, Schuessler, & Costner, 1977, p. 313)

All variables in this model were endogenous because the model proposed that they were dependent on at least one other variable in the model. The term "path model" is usually restricted to causal models in which no feedback effects are postulated. The model was recursive, as there were no feedback loops or reciprocal

recursive, as there were no feedback loops or reciprocal causations postulated between the variables. The model was not intended to be all-inclusive.

The model proposed that the variables knowledge, susceptibility to peer pressure, locus of control, and self-esteem affect sexual activity both directly and by acting through the variables of attitude toward AIDS and perceived vulnerability. In the model, no assumption was made that attitude toward AIDS or perceived vulnerability had an effect on any variable other than sexual activity.

Although correlations between attitude toward AIDS or perceived vulnerability and the other four variables were taken into account in estimating the other coefficients of the model, no claim was made regarding how these correlations were generated. The calculated path coefficients indicated the direction and strength of the hypothesized relationships.

The same path structures were tested separately for males and females. Least-squares path coefficients (standardized partial regressions) were reported for all predicted paths. Correlations were first analyzed separately for males and females. The use of multiple regression analysis provided path coefficients. These data were utilized to determine whether significant relationships exist between selected psychosocial

characteristics of ninth-grade adolescents and sexual activity.

CHAPTER IV

RESULTS

The primary focus of this study was whether or not a relationship exists between instances of AIDS risk behaviors, namely sexual activity, and selected psychosocial characteristics of ninth-grade students. The major hypotheses drawn from this research question were:

1. Sexual activity in adolescents leading to exposure to the AIDS virus is a direct function of attitude toward AIDS, perceived vulnerability, AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.
2. Attitude toward AIDS in adolescents is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.
3. Perceived vulnerability in adolescents is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.
4. The variables AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control will have an indirect effect on sexual activity by acting directly on attitude toward AIDS and perceived vulnerability.

5. There will be no important differences in the causal model for sexual activity between genders.

Results

To settle the question of whether the subjects could be treated as one group or had to be split on the basis of gender, and thus decrease the degrees of freedom in subsequent analyses, the first analysis dealt with gender. A subhypothesis was developed that related to the gender variable.

Gender Differences

Subhypothesis 1: More males than females will be sexually active.

National studies have indicated that, among high school students, males report more sexual activity than females (CDC, 1989). Such was not found to be the case in this study of 100 males and 79 females. There were 45 females (58%) who were sexually active and 51 males (51%) who were sexually active. The difference between the number of females and the number of males that were found to be sexually active was not statistically significant ($X^2 = .8$) at the .10 level. Because of this, it was not deemed necessary to do a separate path analysis for each sex, so the data were combined. Means and standard deviations for the seven variables for males and females are shown in Appendix E. Although there were differences

in two of the variables between the genders, the data showed no significant differences in the model leading to sexual activity between the sexes; therefore, the data failed to support the gender hypotheses.

Correlations for all variables were analyzed next. Correlations for each sex are found in Appendix F. As it had been determined that the differences between males and females were not significant, the intercorrelational matrix for each pair of variables, on all subjects, is presented in Table 1.

Subsequent analyses of the data will refer to the major research hypotheses. From the diagram presented in Figure 1, four hypotheses were proposed that relate sexual activity to the variables of attitude toward AIDS, perceived vulnerability, AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control. The data were statistically tested and results relative to each hypothesis are presented in this section.

Hypothesis One

Sexual activity in adolescents leading to exposure to the AIDS virus is a direct function of attitude toward AIDS, perceived vulnerability, AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

Table 1

Intercorrelational Matrix for All Subjects

	K	A	SE	PP	LOC	PV	SA
K	1.00	-.34	.29	-.07	.26	-.14	-.10
A		1.00	-.06	.03	-.15	.19	.01
SE			1.00	-.32	.21	.04	-.24
PP				1.00	-.00	.17	.28
LOC					1.00	.01	-.20
PV						1.00	-.11
SA							1.00

Note. Values above .13 are statistically significant at $p < .05$. K = AIDS knowledge, PP = peer pressure, A = attitude toward AIDS, SE = self-esteem, PV = perceived vulnerability, LOC = locus of control.

It was assumed that the more positive the attitude toward AIDS, the more likely an individual would engage in sexual activity. A lower attitude score is comprised of factors relating to fear of contagion and perceived threat, both of which are influenced by the internal meaning of AIDS as well as misinformation about the disease (Meisenhelder & LaCharite, 1989). Attitude toward AIDS was not shown to be significantly related to

sexual activity, ($r = .01$, $p = .432$). Analysis of the data showed an inverse relationship between knowledge and attitude toward AIDS, ($r = - .34$, $p = .001$); this indicated the more knowledge an individual has, the less positive his or her attitude toward AIDS.

Perceived vulnerability had an inverse correlation with knowledge ($r = - .14$). This indicated that the more knowledgeable an individual is relative to AIDS, the less vulnerable he or she perceives his or herself to be to AIDS.

It was assumed that the higher the degree of accurate knowledge regarding AIDS, the less likely an individual would be to engage in sexual activity. Knowledge was not found to correlate significantly to the risk behavior of sexual activity ($r = .10$, $p = .088$). Knowledge has not been identified as a factor in reducing risk behavior in adolescents.

It was theorized that the greater the degree of susceptibility to peer pressure, the more likely an individual would be to engage in sexual activity. Peer pressure showed the strongest influence of any variable on sexual activity, $r = .27$ ($p = .001$) for the two sexes together.

It was theorized that the higher the self-esteem, the less likely an individual would engage in sexual

activity. Self-esteem was related to sexual activity ($r = .24$) at the .001 level. This affirmed prior studies that sexual activity is engaged in as a means of increasing self-esteem.

It was theorized that the more internal the measure of locus of control, the less likely an individual would be to engage in sexual activity. The relationship of $r = - .20$ ($p = .003$) confirmed that the higher the degree of internal locus of control, the less likely an individual will be to engage in sexual activity.

While several indirect effects were associated with these predictive variables, only two--susceptibility to peer pressure and locus of control--had direct effects which approached an acceptance level of significance. To further examine the relationship between the variables and sexual activity, and to define the effects of the variables proposed in Hypotheses 2, 3, and 4, a path analysis was constructed. To accomplish this, three multiple regression analyses were run and no significant relationships were found.

Three sets of multiple regressions are shown in Tables 2, 3, and 4. These show the Beta values derived to test the independent variables with the selected dependent variable in the particular path under consideration. Table 2 contains multiple regression on

Table 2

Beta Values, t-Values, and p Values for Sexual Activity

Variable	Beta	<u>t</u>	<u>p</u>
Attitude	.00	-.06	.95
Perceived Vulnerability	-.16	-2.12	.04
Knowledge	-.05	-.66	.51
Peer Pressure	.25	3.33	.00
Self-Esteem	-.10	-1.21	.23
Locus of Control	-.17	-2.31	.02

Note. $R = .39$. $F(6, 166) = 4.97$. $p = .00$.

Table 3

Beta Values, t-Values, and p Values for Attitude

Variable	Beta	<u>t</u>	<u>p</u>
Knowledge	-.33	-4.36	.00
Peer Pressure	.03	.36	.72
Self-Esteem	.06	.74	.46
Locus of Control	-.07	-.98	.33

Note. $R = .35$. $F(4, 170) = 5.88$. $p = .00$.

Table 4

Beta Values, t-Values, and p Values for Perceived
Vulnerability

Variable	Beta	t	p
Knowledge	-.16	-1.96	.05
Peer Pressure	.20	2.53	.01
Self-Esteem	.16	1.99	.05
Locus of Control	.01	.19	.85

Note. $R = .24$. $F(4, 169) = 2.68$. $p = .03$.

sexual activity; Table 3 contains multiple regression on attitude; and Table 4 contains multiple regression on perceived vulnerability. Under each table, the reader will find the multiple R value, its F ratio, and the p value of the F ratio. The level of significance for all statistical tests was .05. In each table, the Beta values are the path coefficients which represent the strength of the association between the listed variables without the effect of the other variables.

Multiple Regression Analysis

Three multiple regression equations were run. The resulting equations for sexual activity, attitude toward AIDS, and perceived vulnerability follow.

Multiple regression equations. The equation in standardized form for the prediction of sexual activity was as follows: $SA = - .17 (LOC) + .25 (PP) - .00 (A) - .16 (PV) - .10 (SE) - .05 (K)$. The multiple correlation for this equation was $R = .39$, thus the predictor variables accounted for about 15% of the variance in sexual activity.

The equation in standardized form for the prediction of attitude toward AIDS was as follows: $A = - .07 (LOC) + .03 (PP) - .33 (K) + .06 (SE)$. The multiple correlation for this equation was $R = .35$, thus the predictor variables accounted for about 12% of the variance in attitude toward AIDS.

The equation in standardized form for the prediction of vulnerability was as follows: $PV = .01 (LOC) + .20 (PP) - .16 (K) + .16 (SE)$. The multiple correlation for this equation was $R = .35$, thus the predictor variables accounted for about 06% of the variance in perceived vulnerability.

Note. The abbreviations in the equations are as follows: K = AIDS Knowledge, PP = Peer Pressure, A = Attitude toward AIDS, SE = Self-Esteem, PV = Perceived Vulnerability, LOC = Locus of Control.

Path Analysis

The data from these multiple regressions were then cast into the path analysis as shown in Figure 2. In this study of the relationship of selected psychosocial measures and adolescent risk behaviors, peer pressure ($r = .25$) had the largest single effect on sexual activity of any of the variables studied. In the path analysis, the predictor variables could account for about 15% of the variance in sexual activity, 12% of the variance in attitude toward AIDS, and 06% of the variance in perceived vulnerability. Locus of control had an effect of ($r = - .17$) upon sexual activity, self-esteem had an effect of ($r = - .10$) upon sexual activity, and knowledge had an effect of ($r = .05$) upon sexual activity.

Hypothesis Two

Attitude toward AIDS in adolescents is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control. Attitude toward AIDS was most affected by knowledge, and that was a negative relationship ($- .3352$). This suggested that having a higher degree of correct knowledge about AIDS does not necessarily lead to a more positive attitude toward AIDS. In this study, those who had a higher degree of correct knowledge about AIDS held more negative

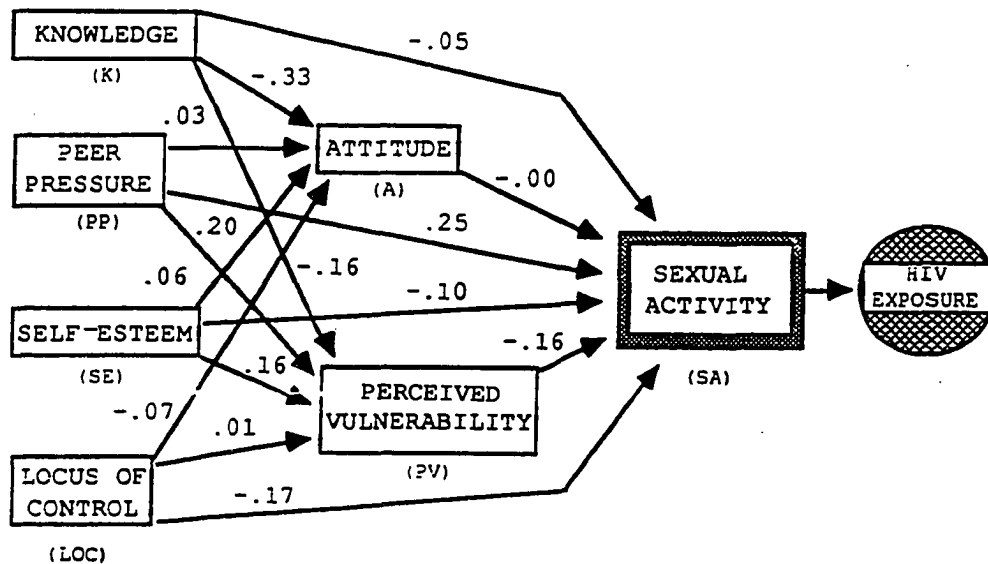


Figure 2. Path analysis for all subjects.

attitudes toward AIDS. The data failed to support this hypothesis at a significant level.

Hypothesis Three

Perceived vulnerability in adolescents is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control. The data supported this hypothesis only minimally as the variables could account for only 06% of the variance in perceived vulnerability ($r^2 = .06$).

Hypothesis Four

The variables AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control will

have an indirect effect on sexual activity by acting directly on attitude toward AIDS and perceived vulnerability. Knowledge was the only variable to have a significant effect on attitude toward AIDS, and that was an inverse relationship. Both peer pressure and locus of control had a small effect on perceived vulnerability. While several indirect effects were associated with these predictive variables, the data failed to fully support this hypothesis.

Summary

Having considered the unique and combined effects of the independent variables in Figure 1 and shown in their quantification in Figure 2, this researcher developed Figure 3 to summarize the data that made significant contributions to the dependent variable, sexual activity. The p values shown in Table 2 were used to determine if that variable qualified to be entered in this path analysis model. Figure 3 is intended strictly as a visual aid to interpreting the path analysis.

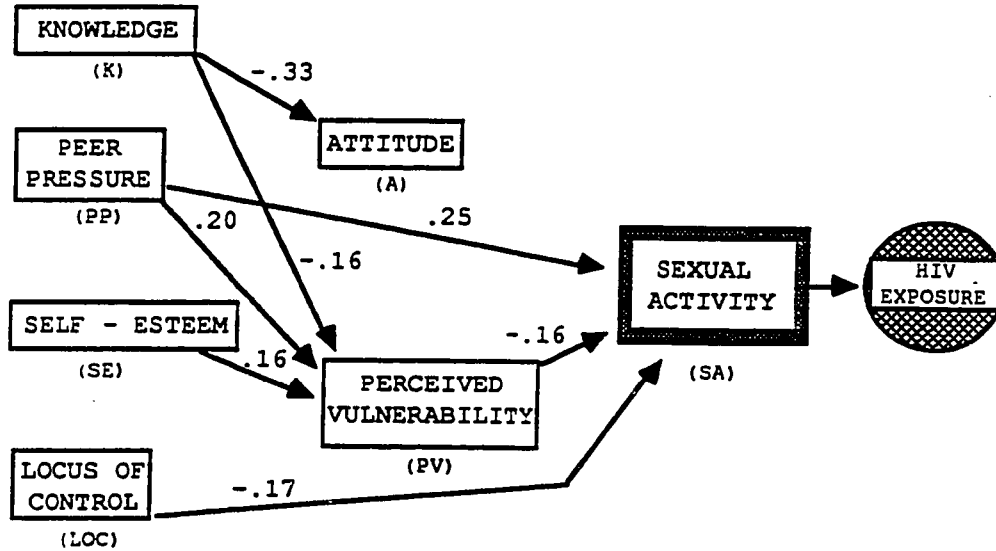


Figure 3. Path analysis for all subjects, nonsignificant paths removed.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Adolescents are at risk of being infected with the AIDS virus because of behaviors in which they engage. This study sought to answer the following questions: Is there a relationship between instances of AIDS risk behaviors and selected psychosocial characteristics of ninth-grade adolescents? and, Does the proposed model have validity for predicting behavior, based on these characteristics?

The population for this study consisted of ninth-grade students enrolled in an urban school district in Iowa during the spring of 1989. Data for the study were collected through the use of a survey instrument that combined a nationally developed AIDS questionnaire (CDC, 1989) and a questionnaire on the variables of susceptibility to peer pressure, self-esteem, and health locus of control (Dielman et al., 1987).

Gender Differences

Although numerous other studies (Calabrese & Seldin, 1985; Chilman, 1980; Mirande, 1968) have found differences in males and females in peer pressure,

self-esteem, and sexual activity, the present study found significant gender differences only in health locus of control ($p = .001$) and attitude toward AIDS ($p = .01$).

In this sample, nearly 50% of ninth-grade level students were sexually active. While this number qualifies it statistically to be a variable in a predictive study, the frequency of occurrence was a surprise to this researcher. Although data collected in other studies indicate that this is normative data, other developmental characteristics of adolescents, such as feelings of invincibility and risk-taking behavior, do not make it an advisable activity.

Attitude

This study found several inconsistencies in attitudes toward AIDS. Students surveyed were in favor of in school education of people with AIDS, but only slightly over half were in favor of them attending their school or of being in the same class. There was inconsistency between respondents' knowledge, or beliefs, about protection from AIDS and their sexual practice (Strunin & Hingson, 1988; Weisman et al., 1989). This was consistent with adolescent developmental characteristics and with similar studies of other ninth-grade students nationwide (CDC, 1990). Adolescents often

respond to the influences of peers without being aware of an inconsistency between their attitudes and practices.

The influence of attitudes toward AIDS on sexual relationships is minimal. The choice to be sexually active appears to follow peer pressure, self-esteem, and locus of control variables. Valdisserrri et al. (1987) found the intervention of a group educational session had the potential ability to influence attitudes about AIDS risk reduction in a positive way by influencing the nonhealth motives of sexual behavior, especially peer norms about safer sex. It is necessary to influence teenage norms so that safer sex is the accepted norm. According to Cohen (1990):

'Safer sex' is a term for sexual practices that have a lower probability of passing human immunodeficiency virus [HIV] from one sexual partner to the other during sexual activity. The term 'safe sex' was initially used to describe such practices, but recent evidence indicates that very few practices are completely free from risk. Thus the term 'safer sex' has been adopted. (p. 265)

Perceived Vulnerability

Beliefs about vulnerability to health problems have been viewed as important determinants to explain why and under what conditions people will take preventive actions (Gochman, 1977; Nemcek, 1990). According to the model presented herein, the disease must be perceived as a major threat in order to effect a behavior change that would protect one from the risk of exposure to HIV

infection. This research showed the level of knowledge was quite high among the sample studied. However, a sizeable number participated in the risk behaviors of sexual activity with multiple partners and without the use of condoms for protection.

The illusion of personal invincibility is a characteristic of adolescent development (Bingham, 1989). While some researchers have found that a person's perceived susceptibility (vulnerability) is correlated with adopting risk-avoidance behaviors (Eisen & Zelman 1986; Norris, 1988), this study found that perceived vulnerability to AIDS has not been a deterrent to risk behavior.

Knowledge

Results of this study showed that the respondents held highly accurate knowledge about AIDS. However, there are significant numbers in the sample who, although knowledgeable about AIDS, are at risk for HIV transmission by having unprotected sexual intercourse and multiple partners.

Peer Pressure

As in other studies previously cited, peer pressure was significantly associated with sexual activity. It is not surprising that, in this study, peer pressure had the most significant direct effect on the sexual activity of

adolescents, as the literature has many examples of the importance of peer pressure in various risk behaviors. Since this study found that peer pressure has the greater effect on sexual activity, it would be advisable to utilize that effect in planning a teaching strategy of peer involvement in the teaching/learning process. Using an adolescent network to disseminate information and support new behaviors has been effective in drug education programs and should be developed in this context.

Self-Esteem

Experimental studies indicate that a person with low self-esteem is less capable of resisting pressure to conform (Coopersmith, 1967). Other studies indicate that as young girls become sexually active early to impress their friends, they may end up with lower self-esteem (Chilman, 1980). In this study, self-esteem was negatively associated with sexual activity, indicating that participating in sexual activity did not increase self-esteem.

It is one of the goals of health education to increase self-esteem, thereby positively affecting health behavior. A positive result of that education would be the delayed onset of sexual activity. Based on the findings herein, the use of effective self-esteem

building activities in health education may lead to less premature sexual activity.

Locus of Control

Fitzpatrick (cited in Calabrese & Seldin, 1985), in a study of ninth-grade students, found that females rely more heavily on peer approval than males, that females experience a greater sense of alienation than do males, and that females feel significantly more powerless than males, a combination which may explain why females in this study had a lower internal locus of control than did males. Other studies which linked internal locus of control with preventive behavior have suggested that personality variables, such as perception of locus of control, mediate the behavioral effects of educational programs (Dielman et al., 1984; Dielman et al., 1987; Miott & Miott, 1975; Valdiserri et al., 1988). In the current study, locus of control was a medium predictor of sexual activity, second only to peer pressure.

Due to possible reciprocal effects of locus of control on susceptibility to peer pressure, there is a need for additional study regarding these effects upon educative endeavors. Teaching an internal locus of control to young children might increase their ability to take charge of their health, reduce health risks, and

enable them to reduce peer pressure by increasing their power to say no.

Conclusions

As shown in Figures 2 and 3, 7 of the 14 pathways were supported by the path analysis. The predictor variables showed a weak to moderate effect on sexual activity. Results indicated that peers significantly influence sexual behavior for this group, directly and through perceived vulnerability.

Based on data collected from this study, the following conclusions were drawn for this group:

1. The data suggest that peer pressure is one of the factors which influence adolescent sexual behavior.
2. The variables self-esteem, perceived vulnerability, and locus of control were significant, but not strong predictors of sexual activity.
3. The data provided little support for the position that either knowledge or attitudes toward AIDS are a direct factor in influencing sexual activity. The direct effects of the other variables were not significantly changed when indirect effects on attitudes toward AIDS or perceived vulnerability were analyzed.
4. Knowledge, as an indicator of cognitive process, has little predictability for sexual activity.

5. Self-esteem showed significant differences between males and females.

6. On the measure of attitude toward AIDS in this study, females scored significantly more positive attitudes than did males.

Recommendations

Adolescents are at great risk of being infected with the AIDS virus. If patterns of sexual behavior are relevant to understanding AIDS, it is important to understand the precursors of sexual behavior. These factors may indirectly influence changes in vulnerability to HIV infection. Therefore, investigations into those factors which effect decision making in relation to sexual activity and the characteristics of adolescents who are at high risk for exposure to the HIV virus need to be considered for the planning and implementation of AIDS education programs. Psychosocial correlates of education influence the effectiveness of education in changing behaviors, which in turn affect the health of adolescents today and in the future. Therefore, it is recommended that:

1. Instructional strategies be designed to influence peer norms regarding safer sex and delay of sexual activity.

2. Factors which were influential need to be encouraged, including those factors which increase one's internal locus of control orientation. It is important for educators to assist students in exploring the values and consequences that are inherent in giving up control of personal decision making to outside forces.

3. School systems should use an evaluation measure to assess whether important HIV-related beliefs, knowledge, and behaviors of high school students change over time.

4. School systems should increase the number of offerings that have an objective of increasing self-esteem. Programs need to recognize and understand the interrelational role of self-esteem and the influence of peer pressure on health decisions.

5. Emphasis should be placed in the curriculum on increasing self-esteem and, for females, on increasing an internal locus of control. Increasing one's assertiveness has potential for increasing the other two factors.

6. Programs should be implemented that reduce behaviors that can lead to HIV infection. Approaches seeking to control HIV transmission provide people with information, skills, and social support conducive to

adopting behaviors that will reduce the spread of infection.

For education to work, it needs to be tailored to the characteristics of target groups and to reach the groups before patterns are initiated. Effective preventive education strategies aimed at modifying behavior (reducing risk behavior) must take into consideration the accepted social norms of the target population group.

In addition to the above recommendations, the researcher recommends that several additional studies be undertaken:

1. Replication of the study should be considered, using other geographical locations and other school-age populations. Gender differences should be considered.
2. Further investigation into susceptibility to peer pressure should be done as a reasonable next step in attempting to understand the sexual activity of adolescents.
3. Investigation into the perceived peer behavior (and influence of best friend) should be done. Whether or not adolescents engage in risk behaviors, such as the use of illegal drugs, sexual intercourse, and delinquency, is related to their perceptions of their friends' attitudes toward such behavior. If adolescents

perceive their friends as disapproving of such actions, they will avoid them (Johnson & Johnson, 1984).

4. Identification should be done of other clusters of predictor variables (i.e., parental influences, adolescent beliefs and values, religiosity) that may be related to early adolescent sexual behavior and that would contribute to an understanding of adolescent lifestyle. Social and psychological factors play a role at various phases of this process, drawing attention to different influences at different stages.

5. Longitudinal study examining the changing importance of characteristics of adolescents and the degree of effectiveness of health education intervention needs to be done.

6. The path diagram for suggested relationships among the variables (see Figure 2) indicated that, considered together, these variables have some utility in predicting sexual activity among adolescents. Among all the factors utilized in assessing sexual behavior, no single factor by itself is sufficient to predict sexual activity. On the basis of results, this researcher offers a revised model (Figure 4) for further study. In this figure, the closer in proximity an identified variable is to HIV Exposure, the stronger is its predictive relationship.

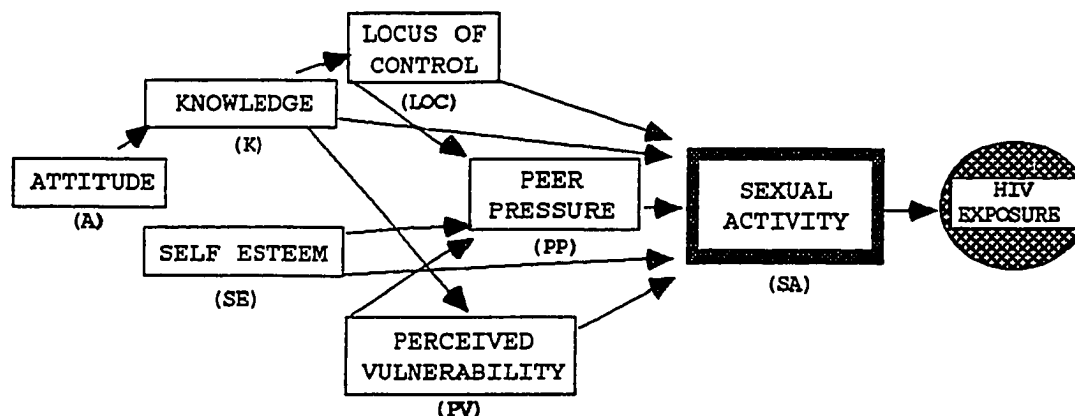


Figure 4. Proposed path model for future study.

Summary

The purposes of this study were to present a path analysis model to examine the relationship between sexual activity and six independent variables and to assess the validity of the model for a sample of ninth-grade adolescents. An appropriately validated model would form a multivariate base for curriculum development in AIDS prevention education. Of the six independent variables in the proposed model, five were found to have a significant relationship. The most significant independent variable was peer pressure, followed by locus

of control and perceived vulnerability. Attitude about AIDS, while significantly affected by knowledge, did not affect anything on its own, and was negatively related to knowledge. There were no significant gender differences in sexual activity. The proposed model was revised to reflect the path analysis and the revised model is proposed as a guide for further research and for curriculum development. Targeting specific psychosocial correlates of behavior appears to provide direction for health education.

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APPENDIX A

Centers for Disease Control Questionnaire

AIDS SURVEY

AIDS is a very serious health problem in our nation. Health officials are trying to find the best ways to teach people about AIDS. This survey has been developed so you can tell us what you know and how you feel about AIDS. The information you give will help us to develop better AIDS education programs for people like yourself.

Do not write your name on this survey or the answer sheet. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really know, feel, or do.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class.

The questions in Part 1 will only be used to describe the type of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Place all your answers on the answer sheet. Fill in the circles completely. Make sure you answer every question. Thank you for your help.

PART 1 DIRECTIONS: Read each question carefully. Fill in the circle on your answer sheet that matches the letter of your answer.

1. What grade are you in?
 - a. 8th
 - b. 9th
 - c. 10th
 - d. 11th
 - e. 12th
2. What is your sex?
 - a. FEMALE
 - b. MALE
3. How old are you?
 - a. 12 YEARS OLD OR LESS
 - b. 13-14
 - c. 15-16
 - d. 17-18
 - e. 19 YEARS OLD OR MORE
4. What is your race?
 - a. WHITE
 - b. BLACK
 - c. HISPANIC
 - d. ASIAN
 - e. OTHER

PART 2 DIRECTIONS: Read each question carefully. Fill in the circle on your answer sheet that matches the letter of your answer.

5. Should students your age talk about AIDS in school?
 - a. YES
 - b. NO
 - c. NOT SURE
6. Should a student with AIDS have the right to go to your school?
 - a. YES
 - b. NO
 - c. NOT SURE

7. Would you be willing to go to class with a student with AIDS?
- a. YES b. NO c. NOT SURE
8. Do you think you can get AIDS?
- a. YES b. NO c. NOT SURE
9. Can you keep from getting AIDS?
- a. YES b. NO c. NOT SURE
10. Do you know where to get information about AIDS?
- a. YES b. NO c. NOT SURE
11. Do you know where to get tested for the AIDS virus?
- a. YES b. NO c. NOT SURE

How many people your age do you think are . . .

12. having sexual intercourse?
- a. ALMOST ALL b. MOST c. HALF d. FEW e. ALMOST NONE
13. using condoms (rubbers) during sexual intercourse?
- a. ALMOST ALL b. MOST c. HALF d. FEW e. ALMOST NONE
14. injecting illegal drugs?
- a. ALMOST ALL b. MOST c. HALF d. FEW e. ALMOST NONE
15. sharing needles or syringes used to inject drugs?
- a. ALMOST ALL b. MOST c. HALF d. FEW e. ALMOST NONE

Can a person get AIDS from the following?

16. Shaking hands with someone who has AIDS.
- a. YES b. NO c. NOT SURE

17. Giving blood.
a. YES b. NO c. NOT SURE
18. Going to school with a student who has AIDS.
a. YES b. NO c. NOT SURE
19. Kissing on mouth.
a. YES b. NO c. NOT SURE
20. Being bitten by mosquitoes or other insects.
a. YES b. NO c. NOT SURE
21. Sharing needles or syringes used to inject drugs.
a. YES b. NO c. NOT SURE
22. Using public toilets.
a. YES b. NO c. NOT SURE
23. Having sexual intercourse.
a. YES b. NO c. NOT SURE
24. Having a blood test.
a. YES b. NO c. NOT SURE

Decide whether these statements are true or false.

25. You can protect yourself from becoming infected with the AIDS virus.
a. TRUE b. FALSE c. NOT SURE
26. You can tell if a person is infected with the AIDS virus by looking at that person.
a. TRUE b. FALSE c. NOT SURE

27. Any person infected with the AIDS virus can infect someone else during sexual intercourse.
- a. TRUE b. FALSE c. NOT SURE
28. A pregnant woman who has the AIDS virus can infect her unborn baby with the virus.
- a. TRUE b. FALSE c. NOT SURE
29. There is a cure for AIDS.
- a. TRUE b. FALSE c. NOT SURE
30. Only gay men can get AIDS.
- a. TRUE b. FALSE c. NOT SURE
31. With regard to AIDS, blood transfusions are now generally safe.
- a. TRUE b. FALSE c. NOT SURE

Can people reduce their chances of becoming infected with the AIDS virus by . . .

32. not having sexual intercourse (being abstinent)?
- a. YES b. NO c. NOT SURE
33. using condoms (rubbers) during sexual intercourse?
- a. YES b. NO c. NOT SURE
34. urinating after sexual intercourse?
- a. YES b. NO c. NOT SURE
35. having sexual intercourse only with one person not infected with the AIDS virus?
- a. YES b. NO c. NOT SURE

36. not having sexual intercourse with a person who uses illegal drugs that can be injected?
a. YES b. NO c. NOT SURE
37. taking birth control pills?
a. YES b. NO c. NOT SURE

PART 2 DIRECTIONS: Read each question carefully. Fill in the circle on your answer sheet that matches the letter of your answer.

38. Have you injected cocaine, heroin, or other illegal drugs into your body?
a. YES b. NO c. NO RESPONSE
39. Have you shared needles or syringes used to inject drugs?
a. YES b. NO c. NO RESPONSE
40. Because of AIDS, have you stopped injecting illegal drugs?
a. YES b. NO c. DOES NOT APPLY
41. Because of AIDS, have you stopped sharing needles and syringes used to inject drugs?
a. YES b. NO c. DOES NOT APPLY
42. How many people have you had sexual intercourse with in your life?
a. 0 b. 1 c. 2 d. 3 OR MORE e. NO RESPONSE

43. How many people have you had sexual intercourse with in the last year?
- a. 0 b. 1 c. 2 d. 3 OR MORE e. NO RESPONSE
44. How old were you the first time you had sexual intercourse?
- a. 12 OR LESS b. 13-14 c. 15-16 d. 17-18
- e. DOES NOT APPLY
45. When you have sexual intercourse, how often is a condom used?
- a. ALWAYS b. SOMETIMES c. RARELY d. NEVER
- e. DOES NOT APPLY
46. Because of AIDS, have you ever talked with your boyfriend or girlfriend about AIDS before having sexual intercourse?
- a. YES b. NO c. DOES NOT APPLY
47. Because of AIDS, have you stopped having sexual intercourse?
- a. YES b. NO c. DOES NOT APPLY
48. Because of AIDS, have you started using condoms during sexual intercourse?
- a. YES b. NO c. DOES NOT APPLY

APPENDIX B

T. E. Dielman Questionnaire

AIDS SURVEY

For the next questions, pretend that these things are really happening.

1. If all of your friends have the latest style jeans and you don't, would you want to buy some?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
2. If a friend dares you to tear a page out of a school library book, would you do it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
3. If you are at a party where your friends are drinking alcohol, would you feel left out if you are not drinking alcohol?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
4. If your best friend is skipping school, would you skip too?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
5. If your best friend offers you a drink of alcohol, would you drink it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
6. If a friend offers you a drink of alcohol, would you want to try it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES

7. If your friends are going to the movies and you have to study for a test, would you go to the movies, anyway?
- a. NO b. PROBABLY NOT c. PROBABLY d. YES
8. If a friend dares you to smoke a cigarette and your parents don't want you to smoke, would you smoke it?
- a. NO b. PROBABLY NOT c. PROBABLY d. YES
9. How easy would it be for you to get alcohol if you wanted it?
- a. VERY EASY b. PRETTY EASY c. PRETTY HARD d. VERY HARD
10. If you had a chance to drink alcohol in the next two years, would you do it?
- a. I WOULD b. I WOULD c. I WOULD d. I WOULD
 DEFINITELY PROBABLY PROBABLY DEFINITELY
 DO IT DO IT NOT DO IT NOT DO IT
11. Do you think you will drink alcohol after you're 21?
- a. I WILL b. I WILL c. I WILL d. I WILL
 DEFINITELY PROBABLY PROBABLY DEFINITELY
 DRINK DRINK NOT DRINK NOT DRINK

Remember, BEER, WINE, and LIQUOR are all kinds of alcohol. These questions ask about any alcohol you might have had during the PAST TWELVE MONTHS.

12. How often do you drink alcohol with your family on special occasions or holidays?
- a. NEVER b. RARELY c. SOMETIMES d. OFTEN

For each of these questions, we want to know how you feel most of the time.

13. Are you proud of your school work?
a. YES b. NO
14. Are you happy at school?
a. YES b. NO
15. Do you and your parents have fun together?
a. YES b. NO
16. Do you like the way you are?
a. YES b. NO
17. Are you happy at home?
a. YES b. NO
18. Do kids your age like you?
a. YES b. NO
19. Are you pretty happy?
a. YES b. NO
20. Do you like the teacher to call on you?
a. YES b. NO
21. Do you get a lot of attention at home?
a. YES b. NO
22. If you have something to say, do you say it?
a. YES b. NO
23. Do kids pick on you?
a. YES b. NO

24. Do your parents understand you?
a. YES b. NO
25. Does your teacher make you feel bad?
a. YES b. NO
26. Do you get upset easily if someone yells at you?
a. YES b. NO
27. Are most kids liked better than you?
a. YES b. NO
28. Are you pretty sure of yourself?
a. YES b. NO
29. Do you often wish you were someone else?
a. YES b. NO

In these questions, we want to know what you believe about sickness and health.

30. Do you believe that good health comes from being lucky?
a. YES b. NO
31. Do you believe that you can do things to keep from getting sick?
a. YES b. NO
32. Do you believe that bad luck makes people sick?
a. YES b. NO
33. Do you believe that you can only do what the doctor tells you to do about your health?
a. YES b. NO

34. Do you believe that if you get sick it is because getting sick just happened?
a. YES b. NO
34. Do you believe that if you get sick it is because getting sick just happened?
a. YES b. NO
35. Do you believe that people who never get sick are just
a. YES b. NO
35. Do you believe that people who never get sick are just plain lucky?
a. YES b. NO
36. Do you believe that your mother must tell you how to keep from getting sick?
a. YES b. NO
37. Do you believe that only a doctor or nurse keeps you from getting sick?
a. YES b. NO
38. Do you believe that when you are sick, you can do things to get better?
a. YES b. NO
39. Do you believe that if you get hurt, it is because accidents just happen?
a. YES b. NO

40. Do you believe that you can do many things to fight illness?
- a. YES b. NO
41. Do you believe that only the dentist can take care of your teeth?
- a. YES b. NO
42. Do you believe that other people must tell you what to do to stay healthy?
- a. YES b. NO
43. Do you always tell the teacher right away if you get hurt at school?
- a. YES b. NO

APPENDIX C

Survey Instrument

AIDS SURVEY

AIDS is a very serious health problem in our nation. Health officials are trying to find the best ways to teach people about AIDS. This survey has been developed so you can tell us what you know and how you feel about AIDS. The information you give will help us to develop better AIDS education programs for people like yourself.

Do not write your name on this survey or the answer sheet. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really know, feel, or do. Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. No names will ever be reported.

You need to understand two related words used in this survey: AIDS and HIV.

*AIDS stands for acquired immunodeficiency syndrome.

*AIDS is caused by the virus, HIV.

*HIV stands for human immunodeficiency virus. HIV is the virus that causes AIDS.

Place all your answers on the answer sheet. Fill in the circles completely.

THANK YOU VERY MUCH FOR YOUR HELP.

PART 1 DIRECTIONS: Read each question carefully. Fill in the circle on your answer sheet that matches the letter of your answer.

1. What is your sex?
 - a. FEMALE
 - b. MALE
2. Who, or what, has been your main source of AIDS education?
 - a. PARENTS
 - b. SCHOOL
 - c. TELEVISION
 - d. NEWSPAPERS/MAGAZINES
 - e. FRIENDS
3. Approximately how many total hours of school time have you been in a class in which you received instruction in any aspect of AIDS?
 - a. 0
 - b. 1-5 hours
 - c. 6-10 hours
 - d. more than 10 hours
4. Have you completed the course "It's Your Choice"?
 - a. YES
 - b. NO
 - c. NOT SURE
5. Should students your age be taught about AIDS/HIV infection in school?
 - a. YES
 - b. NO
 - c. NOT SURE
6. Should a student with AIDS/HIV virus be allowed to go to your school?
 - a. YES
 - b. NO
 - c. NOT SURE
7. Would you be willing to be in the same class with a student with AIDS/HIV infection?
 - a. YES
 - b. NO
 - c. NOT SURE

8. Do you know where to get good information about AIDS/HIV infection?
 - a. YES
 - b. NO
 - c. NOT SURE
9. Do you know where to get tested to see if you are infected with the AIDS virus (HIV)?
 - a. YES
 - b. NO
 - c. NOT SURE
10. Do you know how to keep from getting the AIDS virus (HIV)?
 - a. YES
 - b. NO
 - c. NOT SURE
11. Have you ever talked about AIDS/HIV infection with a friend?
 - a. YES
 - b. NO
 - c. NOT SURE
12. Have you ever talked about AIDS/HIV infection with your parents or other adults in your family?
 - a. YES
 - b. NO
 - c. NOT SURE
13. Can a person get AIDS/HIV infection from holding hands with someone?
 - a. YES
 - b. NO
 - c. NOT SURE
14. Can a person get AIDS/HIV infection from sharing needles used to inject (shoot up) drugs?
 - a. YES
 - b. NO
 - c. NOT SURE
15. Can a person get AIDS/HIV infection from being bitten by mosquitoes or other insects?
 - a. YES
 - b. NO
 - c. NOT SURE

16. Can a person get AIDS/HIV infection from donating blood?
a. YES b. NO c. NOT SURE
17. Can a person get AIDS/HIV infection from having a blood test?
a. YES b. NO c. NOT SURE
18. Can a person get AIDS/HIV infection from using public toilets?
a. YES b. NO c. NOT SURE
19. Can a person get AIDS/HIV infection from having sexual intercourse without a condom (rubber)?
a. YES b. NO c. NOT SURE
20. Can a person get AIDS/HIV infection being in the same class with a student who has AIDS/HIV infection?
a. YES b. NO c. NOT SURE
21. Can you tell if people are infected with the AIDS virus (HIV) just by looking at them?
a. YES b. NO c. NOT SURE
22. Can a person who has the AIDS virus (HIV) infect someone else during sexual intercourse?
a. YES b. NO c. NOT SURE
23. Can a pregnant woman who has the AIDS virus (HIV) infect her unborn baby with the virus?
a. YES b. NO c. NOT SURE

24. Is there a cure for AIDS/HIV infection?
a. YES b. NO c. NOT SURE
25. Is it true that only homosexual (gay) men can get AIDS/HIV infection?
a. YES b. NO c. NOT SURE
26. Can people reduce their chances of becoming infected with the AIDS virus (HIV) by not having any kind of sexual intercourse (being abstinent)?
a. YES b. NO c. NOT SURE
27. Can people reduce their chances of becoming infected with the AIDS virus (HIV) by using condoms (rubbers) during sexual intercourse?
a. YES b. NO c. NOT SURE
28. Can people reduce their chances of becoming infected with the AIDS virus (HIV) by not having any kind of sexual intercourse with a person who has injected (shot up) drugs?
a. YES b. NO c. NOT SURE
29. Can people reduce their chances of becoming infected with the AIDS virus (HIV) by not taking birth control pills?
a. YES b. NO c. NOT SURE
30. Have you ever injected (shot up) cocaine, heroin, or other illegal drugs into your body?
a. YES b. NO

31. In the last year, have you injected (shot up) cocaine, heroin, or other illegal drugs into your body?
- a. YES b. NO
32. Have you ever shared needles used to inject (shoot up) any drugs?
- a. YES b. NO
33. In the past year, have you shared needles used to inject (shoot up) any drugs?
- a. YES b. NO
34. With how many people have you had any kind of sexual intercourse in your life?
- a. 0 b. 1 c. 2 d. 3 e. 4 or more
35. With how many people have you had any kind of sexual intercourse in the last year?
- a. 0 b. 1 c. 2 d. 3 e. 4 or more
36. How old were you the first time you had any kind of sexual intercourse?
- a. I have never had any kind of sexual intercourse
- b. 12 years or older
- c. 13-14 years old
- d. 15-16 years old

37. When you have any kind of sexual intercourse, how often is a condom (rubber) used?
- a. I have never had any kind of sexual intercourse
 - b. Always
 - c. Sometimes
 - d. Rarely
 - e. Never

FOR THIS SET OF QUESTIONS, CHOOSE THE ANSWER THAT BEST DESCRIBES WHAT YOU THINK.

38. How serious is the threat of AIDS to people like yourself?
- a. very serious
 - b. somewhat serious
 - c. of no concern
39. How serious do you think the AIDS problem is to our nation's health?
- a. very serious
 - b. somewhat serious
 - c. of no concern
40. What do you consider your risk is for being infected with the AIDS/HIV virus?
- a. very likely
 - b. somewhat likely
 - c. unlikely
 - d. no chance

FOR THE NEXT QUESTIONS, PRETEND THAT THESE THINGS ARE REALLY HAPPENING.

41. If all of your friends have the latest style jeans and you don't, would you want to buy some?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
42. If a friend dares you to tear a page out of a school library book, would you do it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
43. If you are at a party where your friends are drinking alcohol, would you feel left out if you are not drinking alcohol?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
44. If your best friend is skipping school, would you skip too?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
45. If a friend offers you a drink of alcohol, would you drink it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
46. If a friend offers you a drink of alcohol, would you want to try it?
a. NO b. PROBABLY NOT c. PROBABLY d. YES
47. If your friends are going to the movies and you have to study for a test, would you go to the movies anyway?
a. NO b. PROBABLY NOT c. PROBABLY d. YES

48. If a friend dares you to smoke a cigarette and your parents don't want you to smoke, would you smoke it?
- a. NO b. PROBABLY NOT c. PROBABLY d. YES
- FOR EACH OF THESE QUESTIONS, WE WANT TO KNOW HOW YOU FEEL MOST OF THE TIME.
49. Are you proud of your school work?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
50. Are you happy at school?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
51. Do you and your parents have fun together?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
52. Do you like the way you are?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
53. Are you happy at home?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
54. Do kids your age like you?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
55. Are you pretty happy?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
56. Do you like the teacher to call on you?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
57. Do you get a lot of attention at home?
- a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER

58. If you have something to say, do you say it?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
59. Do kids pick on you?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
60. Do your parents understand you?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
61. Does your teacher make you feel bad?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
62. Do you get upset easily if someone yells at you?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
63. Are most kids liked better than you?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
64. Are you pretty sure of yourself?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER
65. Do you often wish you were someone else?
a. ALWAYS b. SOMETIMES c. SELDOM d. NEVER

IN THESE QUESTIONS, WE WANT TO KNOW WHAT YOU BELIEVE
ABOUT SICKNESS AND HEALTH.

66. Do you believe that good health comes from being
lucky?
a. YES b. NO
67. Do you believe that you can do things to keep from
getting sick?
a. YES b. NO

68. Do you believe that bad luck makes people sick?
a. YES b. NO
69. Do you believe that you can only do what the doctor tells you to do about your health?
a. YES b. NO
70. Do you believe that if you get sick it is because getting sick just happened?
a. YES b. NO
71. Do you believe that people who never get sick are just plain lucky?
a. YES b. NO
72. Do you believe that your mother must tell you how to keep from getting sick?
a. YES b. NO
73. Do you believe that only a doctor or nurse keeps you from getting sick?
a. YES b. NO
74. Do you believe that when you are sick, you can do things to get better?
a. YES b. NO
75. Do you believe that if you get hurt, it is because accidents just happen?
a. YES b. NO

76. Do you believe that you can do many things to fight illness?
- a. YES b. NO
77. Do you believe that only the dentist can take care of your teeth?
- a. YES b. NO
78. Do you believe that other people must tell you what to do to stay healthy?
- a. YES b. NO
79. Do you always tell the teacher right away if you get hurt at school?
- a. YES b. NO

APPENDIX D

Letter to Parents

WATERLOO COMMUNITY SCHOOLS

Administration Building · 1516 Washington Street · Waterloo, Iowa 50702

INSTRUCTIONAL SERVICES DIVISION

Phone (319) 291-4800

Dear Parent:

During the week of March 6, the Waterloo Community Schools will be cooperating with a researcher at the University of Northern Iowa by giving a survey to all ninth-grade students enrolled in the course, "It's Your Choice."

The course "It's Your Choice" is required of all ninth-grade students to meet the new state curriculum standards and contains information on AIDS. Your child is presently enrolled in this course. We would like to have your permission to have him or her participate in the survey at the beginning and again at the end of the course.

The survey is intended to provide us with information which we feel will help us improve our AIDS education component to best meet the needs of our students. In addition to questions regarding AIDS knowledge, attitudes, and practices, the students will be asked other questions relating to self-esteem, peer pressure, and other health concepts. The students' answers are anonymous and confidential, as no names or identification will be recorded. Participation in this survey will not in any way affect the child's grade in this class.

Copies of the survey may be seen at the principal's office. If you do not wish your child to participate in this study, you may exempt him or her. In order to participate in this study, it is necessary for your child to return this signed slip to his or her physical education teacher by April 14, 1989.

We thank you for your cooperation as we seek continually to improve our program.

_____ I give my permission for my child to take the AIDS survey.

_____ I do not want my child to participate in this study.

APPENDIX E

**Means and Standard Deviations
for Males and Females**

Means and Standard Deviations for Males and Females

	Males			Females			t	p
	n	M	S.D.	n	M	S.D.		
Knowledge	100	17.32	2.48	79	16.73	3.31	1.35	>.05
Attitude	100	1.38	.32	79	1.55	.44	-3.01	<.01
Self-Esteem	99	2.85	.40	78	2.90	.34	-.83	>.05
Peer Pressure	99	2.61	.70	79	2.37	.69	2.24	<.05
Locus of Control	98	1.86	.13	77	1.78	.19	3.42	<.01
Vulnerability	98	2.25	.49	79	2.20	.56	.68	<.01

Note. Ns may vary from 98 to 100 (males) and 77 to 79 (females) due to omissions in entry data.

APPENDIX F

Intercorrelational Matrix for All Subjects

Intercorrelational Matrix for All Subjects.

(Males upper, females lower).

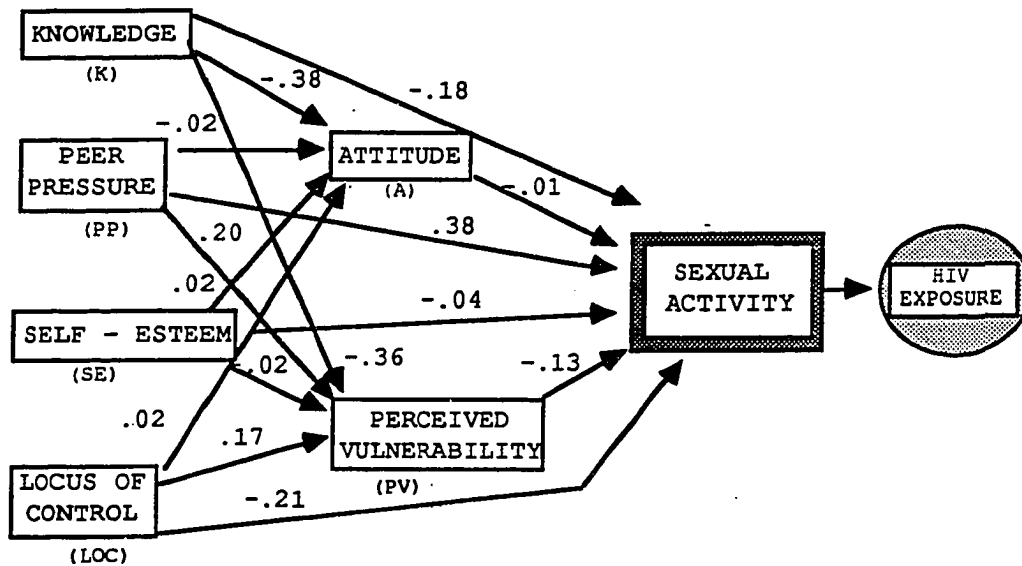
 $n = 179$.

	K	A	SE	PP	LOC	PV	SA
K	1.00	-.26	.20	-.07	.06	.08	.05
A	-.36	1.00	-.05	.14	-.08	.09	-.03
SE	.43	-.10	1.00	-.26	.13	.20	-.20
PP	-.10	.00	-.40	1.00	-.08	.11	.22
LOC	.38	-.17	.38	-.02	1.00	-.07	-.08
PV	-.33	.29	-.17	.24	.04	1.00	-.21
S	-.24	.03	-.31	.38	-.31	-.00	1.00

APPENDIX G

Multiple Regression--Females

Multiple Regression--Females



$$SA = - .21 (LOC) + .38 (PP) - .01 (A) - .13 (PV) - .04 (SE) - .18 (K).$$

Multiple correlation $R = .52$, predictor variables account for about 27% of the variance in sexual activity.

$$A = .02 (LOC) - .02 (PP) - .38 (K) + .02 (SE)$$

Multiple correlation $R = .36$, predictor variables account for about .13% of the variance in attitude.

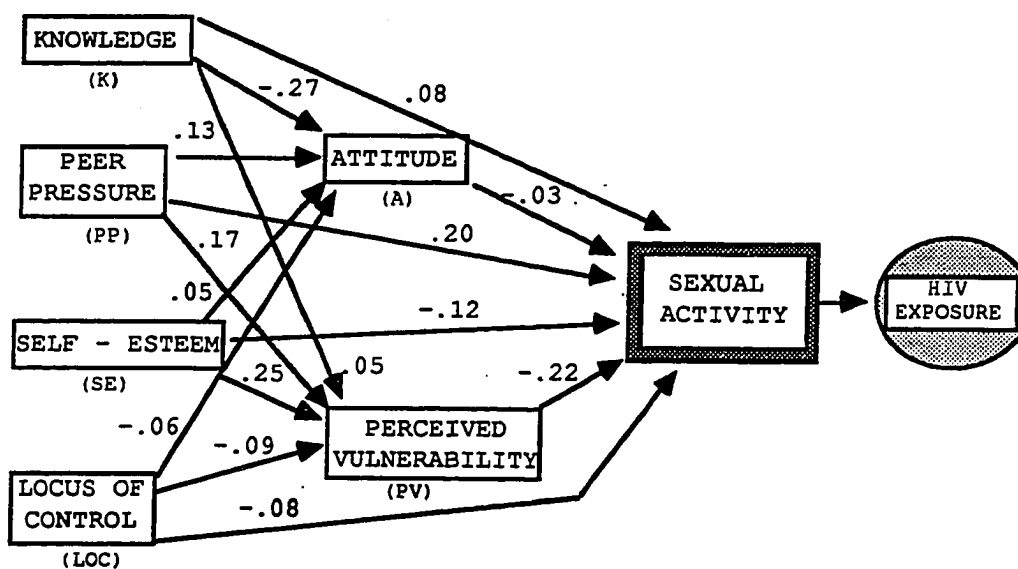
$$PV = .17 (LOC) + .20 (PP) - .36 (K) - .02 (SE)$$

Multiple correlation $R = .34$, predictor variables account for about .12% of the variance in perceived vulnerability.

APPENDIX H

Multiple Regression--Males

Multiple Regression--Males



$$SA = - .08 (LOC) + .20 (PP) - .03 (A) - .22 (PV) - .12 (SE) + .08 (K).$$

Multiple correlation $R = .35$, predictor variables account for about 12% of the variance in sexual activity.

$$A = - .06 (LOC) + .13 (PP) - .27 (K) + .05 (SE)$$

Multiple correlation $R = .31$, predictor variables account for about 10% of the variance in attitude.

$$PV = - .09 (LOC) + .17 (PP) + .05 (K) + .25 (SE)$$

Multiple correlation $R = .28$, predictor variables account for about 08% of the variance in perceived vulnerability.