1993

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

Erika Lea Kumerow

University of Northern Iowa

Copyright ©1993 Erika Lea Kumerow
Follow this and additional works at: https://scholarworks.uni.edu/etd

Let us know how access to this document benefits you

Recommended Citation
https://scholarworks.uni.edu/etd/693

This Open Access Thesis is brought to you for free and open access by the Graduate College at UNI ScholarWorks. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.
PREDICTING ADOLESCENT AIDS-RELATED RISK BEHAVIOR
FROM PSYCHOSOCIAL FACTORS:
A REPLICATION

An Abstract of a Thesis
Submitted
In Partial Fulfillment
of the Requirements for the Degree
Specialist in Education

Erika Lea Kumerow
University of Northern Iowa
July 1993
The purpose of this study was to replicate Hays's (1992) methodology and extend her sample size. Replication of Hays's (1992) results would allow for generalization and would lend support to the path model of sexual activity she proposed.

Subjects for the study were 529 ninth grade students attending four schools in a rural midwestern state. Of the four schools, three were public schools and one was a parochial school. The parochial school was made up of two separate buildings, one located in a metropolitan area and the other in a rural area. Although the buildings were considered to be combined as one school, each building employed different personnel and was attended by different students. Of the public schools, two were located in a rural area and the remaining school was located in a metropolitan area. In the three public schools, the subjects for the study were enrolled in social studies. In the remaining parochial school, the subjects attending one building were enrolled in world history, while those attending the other building were enrolled in theology. These courses were mandatory requirements of all ninth grade students.

The sample was surveyed by means of a questionnaire compiled by Hays (1992). This questionnaire was a
The data were statistically analyzed in accordance with Hays's (1992) methodology and were then cast into her path model. Of the six independent variables in the model, three were found to have a significant, direct relationship to sexual activity. Locus of control had a significant relationship to attitude, and self-esteem had an indirect relationship to sexual activity through perceived vulnerability. The most significant independent variable was peer pressure, which was a negative relationship, followed by perceived vulnerability, and knowledge. There were no significant gender differences in sexual activity. Factor analysis revealed the need for further work on the survey instrument. Targeting specific psychosocial factors influencing adolescents' behavioral choices, appears to provide direction for AIDS prevention education.
PREDICTING ADOLESCENT AIDS-RELATED RISK BEHAVIOR FROM PSYCHOSOCIAL FACTORS: A REPLICATION

A Thesis
Submitted
In Partial Fulfillment of the Requirements for the Degree Specialist in Education

Erika Lea Kumerow
University of Northern Iowa
July 1993
Copyright by
ERIKA LEA KUMEROW
July 1993
All Rights Reserved
This study by: Erika Lea Kumerow
Entitled: Predicting Adolescent AIDS-Related Risk Behavior
from Psychosocial Factors: A Replication

has been approved as meeting the thesis requirement for
the Degree of Specialist in Education

7/13/93
Date
Dr. Donald Schmits, Chair, Committee

7/19/93
Date
Dr. Charles Dedrick, Committee Member

7-13-93
Date
Dr. Joel Wells, Committee Member

7-28-93
Date
Dr. John Somervill, Dean, Graduate College
I would like to thank the members of my committee, Dr. Charles Dedrick and Dr. Joel Wells, for their knowledge, assistance, and time. A special thank you is extended to my thesis chairperson, Dr. Donald Schmits, for his knowledge, guidance, time, and encouragement throughout this project. Without the support of these committee members the successful completion of this project would not have been possible.

I would also like to acknowledge Mary Howard and Dr. Bruce Rogers for their contributions during the statistical analysis procedures. In addition, I would like to thank my fellow friends and graduate students who offered support, encouragement, and empathy throughout this project and throughout my graduate school experience.

Most importantly, I would like to express my appreciation and gratitude to my entire family; especially to my parents, Floyd and Judy Kumerow, who have always been a source of support, love, and encouragement. They taught me to believe in myself and to always strive to be the best that I can be. I am forever grateful.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES.</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF FIGURES.</td>
<td>vii</td>
</tr>
<tr>
<td>CHAPTER I--THE PROBLEM.</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Purpose.</td>
<td>4</td>
</tr>
<tr>
<td>Significance of the Study.</td>
<td>6</td>
</tr>
<tr>
<td>Assumptions of the Study.</td>
<td>7</td>
</tr>
<tr>
<td>Limitations of the Study.</td>
<td>7</td>
</tr>
<tr>
<td>Definitions of Terms.</td>
<td>8</td>
</tr>
<tr>
<td>Summary</td>
<td>10</td>
</tr>
<tr>
<td>CHAPTER II--REVIEW OF LITERATURE.</td>
<td>12</td>
</tr>
<tr>
<td>HIV Exposure.</td>
<td>13</td>
</tr>
<tr>
<td>Adolescent Sexual Activity.</td>
<td>17</td>
</tr>
<tr>
<td>Attitude</td>
<td>19</td>
</tr>
<tr>
<td>Perceived Vulnerability.</td>
<td>21</td>
</tr>
<tr>
<td>Studies of AIDS Knowledge, Attitude, and Behavior.</td>
<td>23</td>
</tr>
<tr>
<td>Peer Pressure</td>
<td>29</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>34</td>
</tr>
<tr>
<td>Health Locus of Control.</td>
<td>37</td>
</tr>
<tr>
<td>Path Model</td>
<td>40</td>
</tr>
<tr>
<td>Critique</td>
<td>43</td>
</tr>
<tr>
<td>CHAPTER III--METHODOLOGY.</td>
<td>46</td>
</tr>
<tr>
<td>Subjects</td>
<td>47</td>
</tr>
<tr>
<td>Instruments</td>
<td>46</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beta Values, $\beta$-Values, and $\rho$ Values for Sexual Activity</td>
<td>59</td>
</tr>
<tr>
<td>2. Beta Values, $\beta$-Values, and $\rho$ Values for Attitude</td>
<td>60</td>
</tr>
<tr>
<td>3. Beta Values, $\beta$-Values, and $\rho$ Values for Perceived Vulnerability</td>
<td>60</td>
</tr>
<tr>
<td>4. Factor Analysis of Survey Instrument</td>
<td>64</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Path model of adolescent characteristics affecting exposure to HIV virus (Hays, 1992)</td>
</tr>
<tr>
<td>2.</td>
<td>Path analysis for all subjects (Hays, 1992)</td>
</tr>
<tr>
<td>3.</td>
<td>Path analysis for all subjects, nonsignificant paths removed (Hays, 1992)</td>
</tr>
<tr>
<td>4.</td>
<td>Path analysis for all subjects, significant paths in bold</td>
</tr>
</tbody>
</table>
CHAPTER I

THE PROBLEM

Human immunodeficiency virus (HIV), the virus that causes AIDS, is a major concern in the United States, affecting all races, socioeconomic classes, and age groupings. The Center for Population Options (CPO) (1990) reported that an estimated 1.5 million Americans are currently infected with HIV. The same source reported 88,096 cases of AIDS in the United States and 51,310 deaths caused by AIDS as of February, 1989. More recently, in 1992 the Centers for Disease Control (CDC, 1992a) received 242,146 accumulative reports of AIDS cases. In addition, the CDC (1993) reported more than 171,890 deaths have been caused by AIDS. According to the CDC (1993), 946 cases of AIDS among teenagers, ages 13-19, were reported as of December 1992. Many public health officials believe that adolescents, because of their experimentation with sex and drugs, are at an increased risk of becoming infected with HIV (CPO, 1990).

Concern exists that the nature of adolescence itself may be a major factor in the increasing number of adolescents becoming infected with the HIV virus (Zylke, 1989). During the period of adolescence, it is a normal occurrence for teens to explore and experiment with their
sexual identity. In addition, certain psychosocial factors, including self-esteem and locus of control, along with the tendency to participate in high-risk behaviors place these individuals at an increased risk of contracting AIDS (Zylke, 1989).

Allensworth and Symons (1989) reported that while only 1% of total AIDS cases are found among adolescents, there are a number of factors indicating the need for prompt intervention with regard to adolescents. For instance, the number of teens who are sexually active has steadily increased in the past 10 years (Allensworth & Symons, 1989; CPO, 1990). In addition, the CPO (1990) reported that a greater number of adolescents are becoming sexually active at younger ages. In accordance, research indicates that teens who become sexually active at a younger age are more likely to have multiple partners, thus increasing the likelihood of contracting a sexually transmitted disease (STD), including HIV (Baldwin & Baldwin, 1988; CPO, 1990; Humm & Kunreuther, 1991). Furthermore, adolescents, ages 15-19, have the highest rates of STDs, with only 21% reporting the use of condoms. Other high risk behaviors of adolescents, including drug and alcohol use, also continue to rise (Allensworth & Symons, 1989; CPO, 1990).

Many adolescents, although knowledgeable about AIDS and its transmission, do not consider themselves to be at-risk of contracting HIV. Walters (1989), in a study
conducted to determine undergraduate college students' knowledge about AIDS and changes in sexual behavior, found that subjects were highly knowledgeable about AIDS, as 80% of the subjects reported being currently sexually active, with 29% of this group changing toward safer sexual behaviors. Disturbingly, 12% of these students began sexually risky behaviors after obtaining knowledge about AIDS. These students did not perceive precautions against contracting AIDS as being necessary, but rather perceived their college status as prohibiting them from this deadly disease. In a similar study conducted by the CPO (1990), results indicated that although adolescents have knowledge about AIDS and its transmission, few sexually active teens change their behavior based solely on factual information.

Parcel (1984) listed several variables in explaining health behavior. The variables included: (a) availability of health services, (b) attitudes toward health care, (c) perceived threat of illness, (d) knowledge about the disease, (e) social interactions, and (f) demographic characteristics. In order to provide the most efficient and successful educational programs aimed at preventing the spread of AIDS, such variables must be addressed and the programs must also address the adolescent's knowledge, belief, and attitudes toward AIDS.
Statement of the Purpose

The present study is designed to replicate the work of Hays (1992) addressing the AIDS-related risk behaviors of adolescents. The study looks at adolescents' knowledge about AIDS, attitudes toward AIDS, and several psychosocial characteristics related to the self-reported sexual activity of adolescents. These psychosocial characteristics include: attitude toward AIDS, perceived vulnerability, knowledge, susceptibility to peer pressure, self-esteem, and locus of control. This study "deviates" from Hays (1992) by examining four samples of ninth grade students, derived from both rural and metropolitan towns in a midwestern state. Hays (1992) used ninth grade students from one metropolitan town in the same midwestern state.

Hays's (1992) purpose statement was twofold: the first being to develop a model for relating the contributions of knowledge about AIDS, attitude toward AIDS, and several psychosocial characteristics to the self-reported sexual activity of adolescents; the second was to validate the proposed causal paths by studying a sample of ninth grade adolescents. The investigator's purpose in conducting a replication of this study was to determine if the results Hays (1992) attained would remain unchanged if the sample was changed. The replication with an expanded sample is important for two reasons. First, little research has been conducted that directly addresses adolescents, despite the
fact that this age group presents many risk factors associated with AIDS (Humm & Kunreuther, 1991; Zylke, 1989). By studying adolescents' knowledge and attitude toward AIDS, as well as psychosocial characteristics which put them at risk for contracting AIDS/HIV, information will be attained which can be used to modify current AIDS prevention curricula. Such modifications could have a direct impact on adolescent sexual activity and consequently reduce their risk of contracting AIDS/HIV. Secondly, the results of the replication study would reveal if there are differences in attitudes as a function of population size. This information would also be useful when developing AIDS prevention curricula.

The hypotheses of the present study are similar to those proposed by Hays (1992); they are as follows:

1. There will be no significant differences in the causal model for sexual activity between genders.

2. 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.

3. Adolescents' attitudes toward AIDS is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.
4. Adolescents' perceived vulnerability is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

5. 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.

**Significance of the Study**

Currently, little research has been conducted that directly addresses adolescents, despite the fact that this age group presents many risk factors associated with AIDS (Humm & Kunreuther, 1991; Zylke, 1989). By studying adolescents' knowledge and attitude toward AIDS, as well as psychosocial characteristics which put them at risk for contracting AIDS/HIV, information will be gained that can be used to modify current AIDS prevention curricula. Such modifications could have a direct impact on adolescent sexual activity and consequently reduce their risk of contracting AIDS/HIV.

Through the knowledge that is attained in this and similar studies, educators can teach adolescents about factors that influence the choices adolescents make; educators can develop a more appropriate AIDS prevention curriculum; and educators can provide the support and reinforcement necessary to deter risk behaviors. Attempts to gain such knowledge as it relates to adolescents helps to
further the preventive efforts that are being made to halt the spread of AIDS.

**Assumptions of the Study**

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

1. Respondents clearly understood the questions. Questions were written in a manner which was assumed to be within the readability level of the respondents, thereby increasing the likelihood that the instrument was within their ability to respond accurately.

2. The respondents completing the survey responded truthfully regarding their sexual 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 schools in a rural midwestern state, where the known incidence of AIDS is low. Therefore, care should be utilized when generalizing results to other geographical areas, since each state varies in the incidence of AIDS cases and the resources expended for prevention.

2. Although confidentiality was assured, the validity of the answers was dependent on the assumption that the
respondents knew the correct answer as it applied to them personally, and reported that answer to the researcher.

3. Researchers are limited by the number of variables influencing behavior that can be studied at one time. The variables examined in the study were restricted to those examined by Hays (1992). Theory suggested that these variables, namely adolescents' knowledge about AIDS, susceptibility to peer pressure, self-esteem, and locus of control, directly influence attitudes, which in turn, determine behavior. In electing to study these variables, others were omitted that may be of equal importance (Hays, 1992).

Definition of Terms

The following terms and corresponding definitions were selected by Hays (1992).

Adolescence: The chronological years of individual growth and development beginning with the onset of puberty (about 13 years of age) and lasting approximately until maturity (about 21 years of age). The adolescent is beyond 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 & Sargent, 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: 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 affect (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, Hoskins, Leach, & Sideleau, 1987).

Summary

Currently, few studies have been conducted which address attitudes toward AIDS, sexual practices of adolescents, and other variables which contribute to risk-taking behavior. Since the goal of AIDS education is to prevent HIV infection, educators should become more aware of factors such as knowledge, attitude, adolescent sexual practices, and other psychosocial variables which put adolescents at risk of contracting AIDS. Incorporate activities into the curriculum that will help students to
understand these concepts, and provide support and reinforcement needed to deter risk behaviors. The aim of the present study was to replicate Hays's (1992) methodology and to extend her sample size. In addition, the information attained would be used to provide educators with information about adolescent sexual practices, knowledge and attitude toward AIDS, and the effects of various psychosocial factors which put adolescents at risk of contracting AIDS.
CHAPTER II

REVIEW OF LITERATURE

Human immunodeficiency virus (HIV), is a retrovirus that attacks the body’s T-4 lymphocytes and ultimately results in a weakened immune system. Once the immune system has been compromised, which results in the development of AIDS, other infections, which do not typically occur in individuals with a healthy immune system, invade the body and ultimately result in the death of the infected person. Once AIDS has been diagnosed, the average life expectancy of patients is reported to be approximately one year (Anderson & May, 1988).

The nature of adolescence itself puts these young people at risk for contracting AIDS. Schools are therefore forced to develop appropriate AIDS prevention curricula that teaches adolescents about AIDS, its transmission, and ways to avoid contracting the deadly disease. In order to do so effectively, educators need to be aware of factors that influence adolescents and put them at risk of becoming infected with the AIDS virus. These factors may include behaviors such as sexual activity and drug use as well as psychosocial factors such as self-esteem and locus of control.
This literature review will follow Hays's (1992) path model by discussing literature relevant to each of the variables being studied by the categories:

1. HIV Exposure
2. Adolescent Sexual Activity
3. Attitude
4. Perceived Vulnerability
5. Studies of AIDS Knowledge, Attitude, and Behavior
6. Peer Pressure
7. Self-Esteem
8. Locus of Control

The discussion will follow this numerical sequence.

**HIV Exposure**

Addressing HIV infection among adolescents requires coming to terms with adolescent sexuality and drug use. Adolescents, as part of their normal development, take risks, many of which have immediate consequences (Humm & Kunreuther, 1991). In the "Surgeon General's Report on AIDS," Dr. C. Everett Koop (1986) targeted the preadolescent and adolescent age groups for education because of this group’s vulnerability when these individuals are exploring their sexuality and experimenting with drugs.

Adolescents are at great risk for developing the AIDS virus because of their sexual curiosity, unprotected sexual and drug behaviors, and lack of knowledge (Bingham, 1989; Haven & Stolz, 1989). In addition, due to the potentially
long latency between HIV infection and AIDS and the difficulty in convincing adolescents to protect themselves from a virus that may not effect them for up to 10 years (Humm & Kunreuther, 1991), the likelihood of this disease spreading largely undetected through the sexually active and intravenous drug using population is increased (Baldwin & Baldwin, 1988; Haven & Stolz, 1989).

In 1989 only 1% of the total AIDS cases were found among adolescents (Allensworth & Symons, 1989). Despite this low incidence, several factors indicated a need for prompt intervention. Between 1971 and 1982, the proportion of sexually active adolescents increased from 28-42%; only 21% of the adolescents who were using contraception reported the use of condoms. In addition, 29% of 12th grade students reported having had experience with an illegal drug within the last month; 1% of these students had used heroin (Allensworth & Symons, 1989). More recently, the Centers for Disease Control (CDC) (1992b) reported that the average age of first sexual encounter among adolescents in the United States is 16, with more than one-half of the adolescent population having sexual intercourse by the age of 19 (Martin, 1991).

More than one-half (54%) of students in grades 9 through 12 who participated in a 1990 CDC survey (CDC, 1992b) reported having sex on at least one occasion in their lifetime; 19% of these students reported that they had had
sex with four or more partners. In the same survey, 45% of students who had sex in the previous three months reported using a condom at last sexual encounter. Of those students who had four or more partners, only 41% had used condoms during their last sexual intercourse (CDC, 1992b).

Basen-Engquist and Parcel (1992) found that only one-third of all sexually active adolescents consistently use contraceptives; 27% do not use any form of contraception. In addition, they found that only 20% of women aged 15-24 report the use of condoms.

The above stated reports concur with other research which reveals that adolescents are engaging in sexual activity at increasingly younger ages. Adolescents who initiate sexual intercourse at younger ages are more likely to have multiple partners and thus increase the likelihood of contracting an STD, including HIV/AIDS (CPO, 1990).

The threat of contracting HIV/AIDS is further complicated by the startling leap in other sexually transmitted diseases (STDs) (CPO, 1990). Humm and Kunreuther (1991) reported that sexually active adolescents have the highest rate of STDs as compared to any other age group, this being largely due to adolescents’ lack of information about sex and their lack of training on how to employ preventive measures. While this age group experiences the highest rates of STDs, they are the least likely to obtain care (CPO, 1990). The same source reports
that each year, 2.5 million teenagers in the United States become infected with an STD; this number can be computed to a ratio of 1:6 sexually active teens and 1:5 nationally reported cases of STDs. The CPO (1990) reported that “people with a history of STDs have a higher incidence of HIV infection” (p. 7).

Drug and alcohol abuse are major co-factors in the STD and HIV/AIDS epidemics (CPO, 1990). It is estimated that over 20,000 adolescents are intravenous drug users. In addition, 1 in 70 high school students reports ever having injected an illegal drug (CDC, 1992b; Martin, 1991). Intravenous drug use provides a direct route for HIV transmission. The crack epidemic is also related to the spread of HIV/AIDS among adolescents, since the use of this drug distorts judgment and leads to risk behavior, as well as creates a compelling sexual need (Humm & Kunreuther, 1991).

Alcohol and other non-injection drugs can also compromise judgment and impair a person’s willingness and ability to use condoms or other precautions while engaging in sexual activity. The result is a reduced likelihood that the drug or alcohol affected person will make appropriate decisions about avoiding and protecting him/herself from HIV/AIDS (CPO, 1990).
Adolescent Sexual Activity

Adolescent sexual activity is a potentially high risk behavior that is often compounded by the adolescents' failure to use contraception (Zylke, 1989). For two decades researchers have reported an increase in the number of adolescents engaging in premarital sex, a decline in the average age of onset, and an increase in the number of sexual partners (Baldwin & Baldwin, 1988; Zylke, 1989).

Diepold and Young (1979) reviewed 20 U.S. studies of adolescent sexual behavior that had been conducted in the previous three decades. Their analysis of the data revealed that males have remained fairly stable in their reported involvement in premarital sex, while females have increased their involvement, resulting in a gradual closure of the gap between the sexes.

Sonenstein, Pleck, and Ku (1989) reported that 60% of males ages 15-19 surveyed in the 1988 National Survey of Adolescent Males reported having had sex. In addition, they reported a significant increase in the levels of sexual activity with increasing age. For example, at age 15 one-third of the males surveyed had had sexual intercourse, one-half at age 16, and two-thirds at age 17. By age 19, 86% of the males reported having had sex. The same source reported a significant increase from 1979 to 1988 in the number of males who had had sexual intercourse. These data suggest an increase in the number of men engaging in premarital sex at
younger ages, despite the nation's growing concern with the spread of AIDS. The CDC (1990) reported the average age of first sexual intercourse to be 16 for females and 15 for males.

A report of data from 1989 to 1991 revealed significant declines in the percentage of high school students engaging in sexual intercourse (59% to 54%) and in those having two or more sexual partners (24% to 19%) (CDC, 1992c). Despite this decline in sexual activity, the same source revealed that adolescents continue to report engaging in risk behaviors associated with HIV/AIDS.

For most adolescents, both males and females, the decision to have sex is unplanned. Only 17% of adolescent females and 25% of adolescent males report planning their first sexual encounter. Greater than two-thirds of these individuals have sex again within six months of their first sexual experience (CPO, 1990; Miller & Moore, 1990).

Adolescents in the United States have typically been slow to utilize contraception (Miller & Moore, 1990). Only 24% of sexually active females ages 15-19 report using contraception consistently. Of those who use contraception, a mere 21% use condoms to protect themselves against STDs (CPO, 1990).

Bachrach and Mosher (1984) found that approximately two-thirds of never married teenagers reported currently using some form of contraception. However, only one-half of
the females aged 15-19 reported using contraception at first intercourse. Ten to 20% of sexually active adolescents do not use any form of contraception (Moore & Peterson, 1989; Sonenstein et al., 1989).

A study conducted in San Francisco reported no change in adolescents' use of condoms between 1984 and 1986 (Kegeles, Adler, & Irwin, 1988). Research in Massachusetts revealed that teens aged 16-19 were found to use condoms more and drugs less in 1988 as compared to in 1986. Rates of sexual activity were slightly higher in 1988 (Strunin & Hingson, 1987).

More recent data reveal an increase in condom use during the second half of the 1980s. Sonenstein et al. (1989) reported an increase in condom use (20% to 54%) at first intercourse and at most recent intercourse (21% to 58%). Unfortunately, 4 in 10 unmarried males ages 17-19 still reported using no method of contraception at first intercourse as did 2 in 10 at most recent intercourse.

Attitude

Research has documented that knowledge alone is ineffective in producing behavior change (Abbott, 1988; Kegeles et al., 1988; Roscoe & Kruger, 1990; Sherr, 1987; Turtle et al., 1989). King et al. (1989) reported that results of numerous studies reveal that teenagers report a very high approval rate of sex before marriage. Researchers have found that although college students' attitudes on
issues surrounding sex reflect conservatism, their behavior does not (Earle & Perricone, 1986; Sherwin & Corbett, 1985; Spees, 1987; Young, 1980).

Basen-Engquist and Parcel (1992) conducted a study which addressed psychosocial predictors of the AIDS virus using a sample of 1,720 Texas ninth graders. Results revealed that attitudes, norms, and self-efficacy were related to one's behavioral intent to engage in, or abstain from, sexual intercourse. Furthermore, attitudes, norms, and intentions were related to the number of sexual partners; self-efficacy and intentions were related to frequency of condom use. The results indicated that attitudes and norms had a direct relationship to behavior as well as an indirect relationship through intention.

Shayne and Kaplan (1988) conducted a review of literature with respect to adolescent attitudes toward AIDS. They reported that although the majority of adolescents know that AIDS is transmitted through sexual intercourse, fewer knew that the use of condoms reduced the likelihood of contracting the disease. In one study, 25% of adolescents believed that AIDS could be transmitted through a handshake; 40% were either unaware or unsure about the use of condoms in preventing transmission (DiClemente, Zorn, & Temoshok, 1987). In another study (Chronicle of Higher Education, 1987), 70% of the adolescents sampled indicated they were sexually active, but only 15% reported changes in their
sexual behavior because of concern surrounding AIDS. Of these 15%, only 20% described methods that are effective in reducing risk. Results of this study indicate that about one-half of the adolescents sampled changed their sexual practices due to concern surrounding the AIDS virus; only 7% initiated the use of condoms.

Moore and Rosenthal (1991b) conducted a study that investigated the relationship between sexual risk-taking and attitudes toward AIDS precautions. Results confirmed that AIDS precautions are multidimensional, with these dimensions being related to gender and sexual risk-taking in diverse ways. For example, it was found that young women had more positive attitudes toward AIDS precautions than young men. Males were more likely than females to expect their partner to take responsibility for precautions and to make excuses for not initiating a discussion concerning precautions. In addition, it was found that attitude patterns varied with different types of risks, namely in relation to the type of sexual partner (casual, regular, or multiple).

**Perceived Vulnerability**

Perceived vulnerability refers to the degree of one's belief that he/she is susceptible to illness or health problems (Gochman, 1977). Beliefs about vulnerability have long been viewed as important determinants of health behavior. The health belief model purports that individuals who perceive themselves as being susceptible to a disorder
are more likely to take preventive action. Furthermore, "the predictive value of perceived vulnerability is enhanced among persons who have high levels of health motivation" (Gochman, 1972, p. 115).

The period of early adolescence is often typified by rebellion against adults and their values; egotism; the emergence of one's sexuality; experimentation with sex, drugs, and alcohol; and the significance of one's peer group. In late adolescence feelings of immortality and unlimited power, independence, and sexual activity also begin to emerge. The combination of these characteristics result in adolescents' feeling invulnerable and engaging in risky behavior, including drug use and unprotected sex (Grossman, 1991).

Many adolescents do not consider themselves to be vulnerable to the AIDS virus. Price, Desmond, and Kukulka (1985) conducted a study involving 250 adolescents residing in Ohio and found that 73% of this sample reported no concerns about contracting AIDS. In Massachusetts, Strunin and Hingson (1987) randomly selected a sample of 829 adolescents. Results revealed that 61% of the sample did not consider themselves to be at risk of contracting AIDS. Connell, Turner, and Mason (1985) report findings in San Francisco which revealed that 79% of adolescents feared contracting AIDS, however 53% also felt they were less likely than others to get the disease.
Current literature indicates that although adolescents appear to know the manner in which AIDS is transmitted, they tend to ignore or deny their vulnerability. Youth who are at-risk tend to do so by stereotyping and scapegoating persons who have AIDS. This provides for a defense against feelings of vulnerability and ultimately results in the failure to employ protective measures or to modify behavior (Shayne & Kaplan, 1988).

Adolescents are concerned with the present and tend to disregard future implications. Many have fatalistic attitudes in which beliefs center around the idea of having little control over what happens and therefore seeing no point in employing precautions (Greig & Raphael, 1989; Grossman, 1991; Moore & Rosenthal, 1991a). In addition, due to the long latency of the virus, many teenagers do not know anyone who has AIDS. They have a hard time believing in a disease that may not effect them for a period of at least 10 years (Grossman, 1991; Humm & Kunreuther, 1991).

All adolescents need to perceive the seriousness of HIV/AIDS as well as their susceptibility to it. They must come to believe that taking preventive action allows for greater benefits than for barriers (Grossman, 1991).

Studies of AIDS Knowledge, Attitude, and Behavior

Data gathered through surveys of high school students reveal that most students are knowledgeable about the manner in which the HIV infection is spread; however, a large

Andre and Bormann (1988) conducted a study to explore the relationship between adolescents' sexual responsibility and knowledge of AIDS. Results reveal a correlation between sexual responsibility and AIDS knowledge. Individuals higher in sexual responsibility were more knowledgeable about AIDS; females were more sexually responsible than males. In respect to AIDS knowledge, 90-100% of the students knew that intercourse without a condom and sharing IV drug needles increased one's risk of contracting AIDS; also, they knew that students were unlikely to become infected from casual contact with an infected person. Over 90% knew that a person could transmit the virus despite not having any observable symptoms of AIDS; they also knew that
having sex with multiple partners increased one's risk of contracting AIDS. These results indicate that although many adolescents know the basic facts about HIV/AIDS transmission, educational efforts must focus on changing adolescent behavior rather than knowledge (Andre & Bormann, 1988).

DuRant, Ashworth, Newman, and Gaillard (1992) examined factors associated with adolescents' AIDS knowledge and perceived risk of currently having HIV infection. Results of the study revealed that the majority of the sample surveyed were knowledgeable about the primary modes of HIV transmission. In accordance with similar studies, results also revealed that many inaccurately believed that insect bites and donating blood increase one's risk of infection. Twenty-five percent believed they could identify an infected person by looking at them, while 17% believed that oral contraception provided some protection against the AIDS virus.

The same source found that students who reported having previously received school-based AIDS education received higher knowledge scores than those who had not received school-based instruction. This is consistent with previous findings in which HIV/AIDS instruction was weakly correlated with AIDS knowledge. This correlation, however, was not related to reduced sexual risk-taking behaviors (Anderson et al., 1990).
In the same study, 23% of the respondents felt there was at least some chance that they were currently infected with the AIDS virus. Respondents who scored higher on the knowledge scale were less likely to believe they were infected with HIV. These findings further support the need to target specific groups of adolescents enrolled in school with more powerful education about HIV/AIDS (DuRant et al., 1992).

Anderson et al. (1990) surveyed 8,098 high school students across the nation to evaluate HIV/AIDS education by measuring knowledge, beliefs, and behaviors among adolescents. The data indicate that the majority of high school students know the primary modes of HIV transmission, however a large proportion believe that donating blood and insect bites also increase the likelihood of contracting the disease. In addition, a portion of the sample held beliefs that could put them at risk of contracting the disease. For example, some believed that birth control pills offer some protection against AIDS and that one can identify a person who has AIDS by looking at them. Misconceptions such as these must be further addressed in HIV/AIDS education efforts in order that students can make informed decisions about their risk-related behavior (Anderson et al., 1990).

Results from a similar study conducted by the CDC (1990) revealed that a median of 62% of the students surveyed have been taught about AIDS or HIV infection in
school. A median of 56% reported having discussed AIDS/HIV with their parents or other adult family members. Fifty-eight percent knew that AIDS cannot be transmitted by donating blood; 48% knew it could not be transmitted through insect bites. Ninety-eight percent of the students knew that HIV/AIDS can be transmitted by sharing needles used to inject drugs or from having sex without using a condom (88%). In the same study, data indicate that a median of 3% reported using IV drugs and 0.9% reported sharing needles used to inject drugs. A median of 56% of the students reported having had sexual intercourse on at least one occasion; 20% reported having had four or more sexual partners. The results of this study indicate that adolescents are at risk for HIV infection because of IV drug use and shared needles and/or because they engage in sexual intercourse with multiple partners.

Data from the 1988 National Survey of Adolescent Males (cited in Sonenstein et al., 1989) reveal that young men were very knowledgeable about AIDS transmission. Almost all respondents knew that AIDS could be contracted through shared needles (99%) and sexual intercourse (90-99%). The majority also knew that AIDS could not be transmitted by casual contact such as shaking hands or hugging (99%). Results reveal that older adolescent males knew significantly more about AIDS than younger ones (Sonenstein et al., 1989).
Salehi et al. (1990) in a study of 817 high school students in Maryland found that most students know the primary modes of AIDS transmission. Approximately 10% were misinformed about preventive practices, with 12 year olds being the most misinformed. Forty percent of the respondents reported never having had sexual intercourse, 15% reported having first had sexual intercourse between the ages of 13-16, although 10% were under the age of 12. Twenty-one percent reported having four or more sex partners in their lifetime. With respect to condom use, only 20% reported always using condoms, with almost 20% indicating rarely or never, despite the fact that 77% reported being educated about HIV/AIDS transmission in school. These results indicate that “although the AIDS Prevention Programs are increasing adolescents’ knowledge and changing their attitudes, more effort must be made to change their behavior” (Salehi et al., 1990, p. 26).

Maticka-Tyndale (1991) studied sexual activities, beliefs, and attitudes of Canadian youth in a longitudinal study conducted in 1981, 1983, 1985, and 1988. Results reveal that adolescents possess accurate knowledge about AIDS, however, this knowledge is not transferred to effective risk reduction. The findings also indicate that youth surveyed in 1988 reported no greater safer-sexual behaviors than youth in 1981, 1983, and 1985. Findings of the study can be summarized by four major points which
reveal that adolescents are not protecting themselves from contracting the AIDS virus: (a) abstaining from sex was found to be temporary; (b) there has been no decrease in the number of reported sexual partners; (c) there has been no decrease in sexual intercourse with persons whom there is no relationship; and (d) there is no data to indicate a change in attitude with respect to either premarital sex or involvement in sexual relations in which affections are not shared.

Overall, educational efforts to date have succeeded in raising awareness and knowledge about AIDS, however they have been deficient in producing adequate changes in behavior (Fineberg, 1988). To be effective, AIDS education must lead to changes in behavior that eliminate or reduce the risk of HIV transmission. Communication of accurate information is a substantial part of effective education, however, it must be accompanied by an individual's motivation and means to carry out the desired changes. Prolonged change also requires a reinforcing environment that supports the new behavior (Fineberg, 1988).

Peer Pressure

Peer pressure is widely recognized as a highly influential component of adolescence (Brown, 1982). Some researchers contend that peer influences stem from adolescents' willingness to conform to group norms and attitudes, rather than from group pressure. This is
particularly true in the early adolescent years. This tendency to conform is viewed as extremely troubling since many researchers purport that the adolescent peer group encourages undesirable behavior (Brown, 1982). In a classic study, Coleman (1961) concluded that adolescents are under considerable pressure to be popular and to be a member of the "in crowd." Coleman further described this crowd as a "sub-culture" with norms and values contradictory to those of adults.

The influence of peer groups can affect adolescent behaviors, such as delinquency, drug abuse, smoking, and many others (Yamaguchi & Kandell, 1987). Often times extensive group involvement counteracts parental involvement. In a 1986 Harris Poll of adolescents aged 12 to 17, 73% of the girls and 50% of the boys identified social pressure as a reason for engaging in premarital sex. Other researchers (Brown, 1982; Newcomer, Gilbert, & Udry, 1980) contend that sexual behavior and attitudes are more likely influenced by what adolescents perceive rather than the actual behavior of their peers.

Billy and Udry (1985) reported results from a longitudinal study which revealed that the sexual behavior of white females was most influenced by the behavior of their best male and female friends. The female participants in the study were more likely to have intercourse if they had friends who were sexually active. Males, on the other
hand, appeared to choose their friends on the basis of prior sexual activity rather than be influenced by friends' behavior. Black participants were not influenced by their friends sexual behavior nor did they pick their friends on this basis (Billy, Rodgers, & Udry, 1984; Billy & Udry, 1985).

Although little is known about the role of peers in the initiation and maintenance of contraception, peer influence is assumed to be important. Parents and relatives are the number one referral source (51%) for adolescent females who go to private doctors for contraceptive advice. However, for those who attend clinics, friends are the leading referral source (44%) (Mosher & Horn, 1989). Sexual partners are rarely the source of referral, however, peers and partners tend to be involved when parents are not. One hypothesis that emerges is the notion that peer support serves as a substitute strategy when parents disapprove of contraceptive use (Nathanson & Becker, 1986).

Brown (1982) conducted a study to assess the effects of peer pressure during the high school years. Findings revealed that both males and females reported feeling pressured in several areas during their high schools years. Females seemed to experience more peer pressure than males, particularly in the areas of dress and grooming styles, having a steady boyfriend, being socially active, and smoking cigarettes. Males reported greater peer pressure
with regard to sexual intercourse. Males and females also differed in their relative ranking of pressure in varying areas. Both sexes ranked being socially active as being the most strongly peer influenced. However, for females, pressure to conform was ranked second while the use of drugs and alcohol received the second highest ranking for males. Pressure to conform was ranked as fifth for males in the study. Little influence was reported in respect to positive relations with parents.

Two principles of adolescence are that behavior is influenced by the behavior of one's friends and that friends select one another on the basis of shared characteristics. These principles stem in part from the numerous studies revealing that the strongest predictor in the use of abusive substances by adolescents is the use of an abusive substance by their friends (Bauman & Fisher, 1986).

In a study of adolescent drinking and cigarette use, Bauman and Fisher (1986) found that adolescents' perceptions of what friends do is a stronger influence than the actual behavior of friends. These perceptions are also more influential when selecting friends.

Kandel, Kessler, and Margulies (1978) found that adolescents were more likely to use marijuana if they had friends who also used, or at least condoned, the drug. In a similar study, Reister and Zucker (1968) reported that adolescents' use of alcohol depended heavily on the peer
group to which they belonged. Simpson (1962) found that peers also influence prosocial behavior. In this study, data indicated that adolescents of both working and middle-class backgrounds aspired to high status occupations if their peers encouraged such aspirations.

Urberg and Robbins (1981) conducted a study on the effects of peer influence on cigarette smoking. Results indicated that both males and females were significantly influenced by peers, but in opposite directions. As the number of friends who smoked increased, males were more likely to downplay the negative effects of smoking. Conversely, females were more likely to emphasize the negative effects of smoking as the number of friends who smoked increased. The results suggest that both the degree and direction of peer influence may differ with respect to gender.

Dielman, Campanelli, Shope, and Butchart (1987) conducted a study to evaluate the influences of susceptibility to peer pressure, self-esteem, and health locus of control and their relationship to adolescents' use of alcohol, cigarettes, and marijuana. Findings reveal that peer pressure was more highly correlated with all substance use, misuse, and intention variables than were self-esteem and health locus of control. The findings support the need for the development of health behavior interventions which focus on the reduction of susceptibility to peer pressure.
Self-Esteem

Self-esteem can be defined as a person's evaluation of himself/herself which is customarily maintained and conveyed as either approval or disapproval. This evaluation indicates the degree to which a person perceives himself/herself as being competent, successful, significant, and worthy (Mullis, Mullis, & Normandin, 1992; Rosenberg, 1965).

Throughout history positive relationships between self-esteem and features of adolescent development have been reported. Specifically, associations between self-esteem and academic achievement (Demo & Savin-Williams, 1983; Rubin, 1978), drug abuse (Reardon & Griffing, 1983), and juvenile delinquency (Lund & Salary, 1980). Current literature reveals that several factors influence the development of adolescent self-esteem. Unfortunately, the specific factors, as well as the nature of their influence, have not been clearly defined. In the cognitive-developmental perspective, self-esteem is believed to change as a function of qualitative differences in the adolescent's thought processes which occur over time and with experience. Thus, variations in self-esteem are believed to be age related (McCarthy & Hoge, 1982; O'Malley & Bachman, 1983).

Mullis et al., (1992) attempted to study changes in adolescents' self-esteem over a three year period using both cross-sectional and longitudinal comparisons of adolescent
self-esteem. Results revealed that grade level was significantly related to self-esteem only in longitudinal comparisons. It was posited that the transition from junior high to senior high school is a critical period for adolescents. During this period adolescents move from a generally well protected environment to a larger, more impersonal high school setting. These events may contribute to the negative effects on adolescent self-esteem.

It is likely that adolescents are more concerned with their self-image and what others think of them than any other age group. Numerous studies have found that adolescent girls report lower self-esteem than do boys (Bower, 1991; Connell, Stroobant, Sinclair, Connell, & Rogers, 1975; Richman, Clark, & Brown, 1985; Simmons & Rosenberg, 1975). One explanation for such findings has been that they reflect the way in which women are evaluated by society, with masculine attributes being more desirable than feminine (Dyson & Szirom, 1983).

In a recent study of adolescents' problems and their relation to self-esteem, Harper and Marshall (1991) found that girls reported having substantially more problems than did boys. The same source reports that four problem areas were found to be involved in the prediction of self-esteem in girls:

1. Self-esteem decreased when the girls had problems adjusting to school work.
2. Self-esteem increased when girls encountered problems with the curriculum and teaching procedures.

3. Problems with health and physical development resulted in lower self-esteem.


In contrast, only one problem area, social and psychological relations, predicted the self-esteem of boys. Porteeous (1981) concluded that “adolescents who admit to experiencing more serious problems tend to have poor self-esteem” (p. 59).

Research has presented negative self-esteem as the generating factor behind adolescents' involvement in deviant behavior (Bynner, O'Malley, & Bachman, 1981; Kaplan, 1975; Rosenberg & Rosenberg, 1978). For adolescents who hold a positive social image of drinking, alcohol use is a likely consequence of low self-esteem (Chassin, Tetzloff, & Hershey, 1985; Leventhal & Cleary, 1980). To the contrary, alcohol use may have the opposite effects on self-esteem by: (a) repressing previous feelings of low self-worth (Gold, 1978); (b) substituting new groups with different norm references (Rosenberg & Rosenberg, 1978); and (c) enabling adolescents to display characteristics of self-control (Labouvie, 1986).

Thompson (1989) studied the effects of early alcohol use on adolescents' relations with peers and self-esteem.
Results reveal that adolescents who perceive drinking to be a sophisticated activity in early adolescence experience boosts in self-esteem. When drinking is not viewed in these terms, self-esteem is unaffected by early drinking.

The literature has been inconsistent in defining whether self-esteem influences sexual behavior or whether sexual behavior influences self-esteem. In a longitudinal study of adolescent sexual activity and its relation to self-esteem, Vernon, Green, and Frothingham (1983) reported that levels of self-esteem did not differentiate those who became pregnant from those who did not. Conversely, Miller, Christensen, and Olson (1987) found that self-esteem was, in fact, positively related to sexual intercourse among adolescents who maintained that premarital sex was acceptable. Self-esteem was negatively related to sexual intercourse among those who believed it was unacceptable.

Adolescents' biological development typically leads their cognitive and emotional development. Thus, adolescents may be physically capable of sexual and reproductive behavior, but may have insufficient cognitive and behavioral skills needed to choose responsible behavior and to understand the consequences of it (Miller & Moore, 1990).

Health Locus of Control

Adolescents, despite being knowledgeable and concerned about health issues, often times fail to adopt positive
health behaviors. Research has demonstrated the need to identify factors which will motivate adolescents to adopt healthy life-styles (Radius, Dielman, Becker, Rosenstock, & Horvath, 1980a; 1980b). Parcel and Meyer (1978) proposed the construct of health locus of control as an intervening variable to influence health behavior. They hypothesized that adolescents who acquired and practiced positive health behaviors would develop increased acceptance of responsibility (internal locus of control) for their health and would consequently adopt positive health behaviors. In response, Dielman, Leech, Lorenger, and Horvath (1984) conducted a study to evaluate the relationship of children's locus of control and self-esteem to health behavior and intentions. Results revealed that children's health locus of control bore little relationship to health behavior and intentions, while self-esteem was related to all but one of the behaviors and intentions considered. The researchers concluded that there was insufficient evidence to endorse the implementation of intervention programs designed to prevent negative health behaviors by focusing specifically on self-esteem and locus of control.

Health educators have found that a relationship exists between health locus of control and an individual's health behavior. Wallston and Wallston (1978) purport that the construct of locus of control may be used to predict and explain health-related behaviors. Their research indicates
that individuals who are internally motivated are more likely to engage in behaviors that facilitate physical well-being. In accordance, adolescents who believe their health is controlled by external factors may be prone to have indiscriminate attitudes regarding problem-oriented motivations, such as alcohol use and the frequency of drinking episodes (Carter, Denson, & Randow, 1985).

The life-style perspective presented by Bruhn (1988) is a theory which suggests that adolescent smoking and drinking are part of a life-style which encompasses behaviors, attitudes, and outlooks relevant to health. In this perspective, an "illness-lifestyle" is characterized by factors such as external locus of control, shyness and social withdrawal, psychological distress, low skills, and "risk-seeking" health behaviors (i.e. smoking and alcohol use) which are learned from sources in one's environment. Numerous studies of adolescent cigarette use (Brunswick & Messeri, 1984; Clarke, MacPherson, & Holmes, 1982) have supported this view by showing that external locus of control predicts cigarette smoking (Thorlindsson & Vilhjalmsson, 1991).

A relationship has also been found between locus of control and the adoption of behavioral changes to reduce the likelihood of HIV infection. Valdiserri, Hartl, and Chambliss (1988) conducted a study of incarcerated drug abusers and found a distinction between locus of control in
individuals who adopted practices that would lower their risk of infection. The researchers hypothesized that individuals with an internal locus of control would be more likely to modify behaviors in an attempt to control health outcomes. Contrary to expectations, results revealed that individuals who practiced incomplete risk reduction were found to have a more internal locus of control. The results suggest that the study of personality variables such as locus of control may improve educators' ability to promote desired preventive practices (Hays, 1992).

Path Model

The replication study followed Hays's (1992) path analysis model, shown in Figure 1, which was employed to investigate the combination of characteristics which would be associated with sexual activity. The model proposed that the variables knowledge, susceptibility to peer pressure, locus of control, and self-esteem effect sexual activity both directly and indirectly by acting through the variables of attitude toward AIDS and perceived vulnerability.

Three multiple regression equations were run on Hays’s (1992) data. The data from the multiple regressions were then cast into the path analysis as shown in Figure 2. Results revealed that peer pressure ($r = .25$) had the largest single effect on sexual activity of any of the variables studied. The analysis further revealed that the predictor variables could account for approximately 15% of
the variance in sexual activity, 12% of the variance in attitude toward AIDS, and 6% of the variance in perceived vulnerability. Locus of control had a direct effect of \((r = -0.17)\) upon sexual activity, as did self-esteem with an effect of \((r = -0.10)\), and knowledge with an effect of \((r = 0.05)\).

![Path model of adolescent characteristics affecting exposure to HIV virus (Hays, 1992, p. 9).](image)

**Figure 1.** Path model of adolescent characteristics affecting exposure to HIV virus (Hays, 1992, p. 9).

Hays (1992) summarized the data that made significant contributions to sexual activity in Figure 3. This figure was provided as a visual aid to interpreting the path analysis.
Figure 2. Path analysis for all subjects (Hays, 1992, p. 77).

Figure 3. Path analysis for all subjects, nonsignificant paths removed (Hays, 1992, p. 79).
Critique

Hays's (1992) sample consisted of 179 ninth grade students, all of whom attended one school located in a metropolitan area in a rural state. Due to the size and nature of the sample, generalizability of the results is questionnable. In addition, the sample she selected was not found to demonstrate significant high risk behaviors, therefore an adequate comparison cannot be made between high-risk individuals and participants in her study.

The questionnaire compiled by Hays (1992) (see Appendix B) contained questions addressing the seven variables proposed in the path model, namely knowledge, peer pressure, self-esteem, locus of control, attitude, perceived vulnerability, and sexual activity. These variables were created by combining scores on questionnaire items corresponding to each variable. One variable, perceived vulnerability, was made up of only one item. Concern exists that one item may not be an adequate measure of perceived vulnerability. In addition, since a factor analysis was not conducted on the survey items, one can only assume that the items between each category are indeed independent.

Four items on Hays's (1992) questionnaire (see Appendix B), namely items 34 through 37, addressed various aspects of sexual activity. Specifically, items 34 and 35 addressed the number of sexual partners in one's life and in the past year respectively. Hays (1992) is unclear as to which items
were used to define the variable sexual activity. Based on the information presented by Hays (1992) (p. 62), one must assume that only question 34 was used in defining sexual activity.

The logic of Hays's (1992) Hypothesis One (p. 69) differs from the multiple regression equations she presented on page 75. Hypothesis One, which corresponds with Hays's (1992) path model presented in Figure 1 (p. 9), predicts that sexual activity is a direct function of attitude toward AIDS, perceived vulnerability, AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control. The logic of Hypothesis One is that the variables attitude and perceived vulnerability are the first two inputs on the path model, with the variables knowledge, peer pressure, self-esteem, and locus of control following. Conversely, the multiple regression equations (p. 75) would indicate locus of control and perceived vulnerability as being the first two inputs, with the variables attitude, perceived vulnerability, self-esteem, and knowledge following. In addition, on Tables 1-3 (p. 73-74), the variables are listed in the order proposed by Hypothesis One; however, the Beta Values, t-Values, and p Values reported correspond with the multiple regression equations (p. 75). This discrepancy between Hypothesis One and the multiple regression equations could indicate that Hays (1992) might not have tested Hypothesis One.
A replication of Hays's (1992) methodology and an extension of Hays's (1992) sample needs to be employed to test the results previously obtained. In addition, a factor analysis needs to be conducted on the survey items to test whether item clusters within each category are indeed independent of item clusters within other categories. Similar results, if obtained, will lend support and generalizability to the conclusions drawn by Hays (1992) and will have a positive effect on diminishing the concerns previously addressed. Results contrary to those obtained by Hays (1992) will serve to challenge the assumptions made and will likely warrant future research in this area.
CHAPTER III

METHODOLOGY

This study was designed to replicate the work of Hays (1992) which investigated the relationship between psychosocial characteristics of ninth grade adolescents and sexual activity which puts them at an increased risk for exposure to the AIDS virus. Specifically, the current 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 methods and procedures involved in conducting this research study are specified in this chapter. The chapter is divided into four major components: (a) subjects, (b) instruments, (c) procedures, and (d) data analysis.
Subjects

Current literature contends that the nature of adolescence itself may be a major factor in the increasing number of adolescents becoming infected with the HIV virus (Zylke, 1989). During this period, adolescents exhibit many behaviors which put them at high risk of contracting the AIDS virus. For this reason, it was decided to select a sample representative of an adolescent population from randomly selected schools in a rural midwestern state.

The subjects for the study were ninth grade students attending four schools in a rural midwestern state. In an effort to extend Hays's (1992) sample and therefore support conclusions and generalizability, an attempt was made to survey ninth grade students in a metropolitan school district similar to Hays's (1992) sample, as well as a rural school in the same geographical region. Two schools fitting these criteria were contacted via mail and were sent a letter requesting their participation (see Appendix A), the study's proposal, and a copy of the questionnaire (see Appendix B). Of the two schools contacted, one declined participation. In response, the same packet of information was sent to seven additional schools in the same rural midwestern state in an effort to extend the sample. Of the seven schools contacted, four declined participation, while three schools agreed to participate. The result was a total of four schools who participated in the study. Of the four
schools, three were public schools and one was a parochial school. The parochial school was made up of two separate buildings, one located in a metropolitan area and the other in a rural area. Although the buildings were considered to be combined as one school, each building employed different personnel and was attended by different students. Of the public schools, two were located in a rural area and the remaining school was located in a metropolitan area. In the three public schools, the subjects for the study were enrolled in social studies. In the remaining parochial school, the subjects attending one building were enrolled in world history, while those attending the other building were enrolled in theology. These courses were mandatory requirements of all ninth grade students. The administration of the survey instrument was appropriate in these courses since both courses include sex education components as part of the curriculum. The number of participants from each school varied as a function of school size, with a range from 39 to 169.

Participation in the survey was completely voluntary. It is believed that the characteristics of the sample population are similar to the general population of the four schools participating in the study.

**Instruments**

The sample was surveyed by means of a questionnaire compiled by Hays (1992) (see Appendix B). This
questionnaire was a combination of two previously developed questionnaires: the Susceptibility to Peer Pressure, Self-Esteem and Health Locus of Control questionnaire, developed by T. E. Dielman, and a questionnaire developed by the Centers for Disease Control (CDC).

The CDC questionnaire was developed for use with 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. This revised version of the questionnaire was field-tested by education agencies in Michigan, Minnesota, and Rhode Island during the fall of 1988. A previous version of the questionnaire was used in at least nine states. Part I of the questionnaire addresses attitudes toward AIDS, Part II, knowledge, and Part III, risk behaviors. The questionnaire is composed of a total of 49 questions.

A factor analysis was not conducted on the revised survey. Factor analysis conducted on the previous CDC survey showed that question sets were found to be uncorrelated by a factor analysis (Hays, 1992). Since the questionnaire was developed as a survey instrument as opposed to a scale, its primary use was for public health rather than education. Results of the revised version were reported in *Morbidity and Mortality Weekly Report*, December 2, 1988.
The demographic portion of the questionnaire included questions pertaining to the extent of formal AIDS education, primary sources of sex information, sex, and the completion of the course, “It’s Your Choice.” This question was omitted from analysis in this replication study since only participants in Hays’s original study had completed this course.

The questions assessing Susceptibility to Peer Pressure, Self-Esteem, and Health Locus of Control developed by T. E. Dielman 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 questions addressing children’s health locus of control adapted from Parcel and Meyer (cited in Dielman et al., 1987) and 17 children’s self-esteem questions adapted from those reported by Coopersmith (cited in Dielman et al., 1987). The eight questions addressing susceptibility to peer pressure were created from questions 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 developed by Dielman et al. (1987). The questions concerning susceptibility to peer pressure, self-esteem, and health locus of control were factor analyzed for use in the instrument. Details of the factor analytic procedures,
index construction, and item content are discussed in Dielman et al. (1987).

In Hays’s (1992) original study, responses for the psychosocial factors were changed from a yes/no format to a Likert format. In addition, a portion of the CDC questionnaire regarding friends’ behavior was deleted. Both changes were made at the request of the participating school district’s administration. These changes were maintained for the present study.

**Procedures**

Ethical considerations of this study involved the protection of the participants’ confidentiality and anonymity. Participation in the survey was voluntary and completely anonymous. Anonymity was assured by the absence of student identification on the test answer sheets or survey sheets. The four participating schools were identified by code on the test answer sheet; however, this school code was not used to identify participating students in any way. The research was approved and conducted according to the guidelines established by the Human Subjects Review Committee at the University of Northern Iowa. The students participating in the survey were enrolled in classes in their respective schools which were taught by a total of eleven teachers. Instructions on how to administer the survey were given to teachers prior to administration (see Appendix C).
A letter explaining the survey and requesting parental permission (see Appendix D) was sent home with all ninth grade students approximately 10 days before the survey was administered. No student was allowed to complete the survey without a parent's signed permission. The survey was available in the principal's office for parental inspection at each of the participating schools one week prior to testing. Sample sizes were determined by the number of parental permission slips returned.

During the month of March, 1993, surveys and optiscan sheets were taken to the selected schools by the investigator and later administered to the students during their regularly scheduled class periods by the social studies and theology teachers. The teachers read the instructions on the first page of the survey (see Appendix C) to the students after dispersing the instrument. Five hundred and twenty nine questionnaires were administered to all ninth grade classes. After completing the questionnaire, the participants returned all materials to an area previously designated by the teacher. The surveys and answer sheets were collected from the schools by the investigator at a later time. Data were entered on a mainframe computer for statistical analysis. A total of 529 usable questionnaires were obtained.
Preanalysis of Data Considerations

It was assumed that the relationship between the variables was linear and additive. Each variable (excluding perceived vulnerability and sexual activity) was proposed as a continuum. The larger the deficiency on each of the variables and the more variables on which a deficiency exists, the greater the probability that the participant 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 development of a model that summarized many of the hypothesized relationships.

All cases were categorized according to reported drug use and sexual activity. Participants who had not used drugs or 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; those who had never had sex were grouped into the second category. Of special note, some participants did not respond to selected items, therefore totals vary on some questions. The two primary risk behaviors which lead to exposure to the AIDS virus are sexual intercourse and injecting IV drugs. In this study, only 3.4% of the participants reported ever injecting drugs, while 28.6% reported ever being sexually active. Thus, for the purpose
of predicting behavior, the study was limited to sexual activity as the risk behavior of concern.

**Data Analysis**

Survey instruments were collected from the participating schools and the data were entered onto a mainframe computer for statistical analysis. A total of 529 usable questionnaires were analyzed. Path analysis was used for testing the model. A chi-square was calculated on gender and sexual activity. No significant gender differences were found, therefore participants were grouped into one category for analysis. Multiple regressions were computed on each of the variables specified 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 was identified as the number answered correctly on knowledge items. The answers "not sure" and "no" were grouped together for dichotomy and were considered incorrect responses.

The attitude toward AIDS score was derived from six items—questions 5, 6, 7, 11, 12, and 39. These questions were disseminated among knowledge items to circumvent an attitudinal response pattern. Sexual behavior was defined primarily in terms of the response indicated on question 34, which asked about the number of sexual partners. For
question 39, the answers "somewhat serious" and "of no concern" were grouped together for dichotomy and were considered incorrect responses.

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

Self-esteem scores were derived from 17 items--questions 49 through 65. Higher scores on the Likert scale reflected a higher self-esteem.

Locus of Control scores were obtained from 14 items--questions 66 through 79. Higher scores indicated a stronger internal locus of control.

Perceived vulnerability scores were obtained from one item, question 40, a 4-point Likert scale which asked, "What do you consider your risk is for being infected with the AIDS/HIV virus?"

To determine if a category of high-risk individuals existed in the study, items 30, 31, 32, 33, 34, 35, and 37 were grouped for analysis. These questions addressed risk activities of IV drug use, needle sharing, number of sexual partners, and condom usage. Due to the minimal number of individuals in this category, it was not included in the analysis.

A path analysis was employed to examine the combination of characteristics which would be associated with sexual activity.
Mueller, Schuessler, and Costner (1977, p. 313) state:

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.

The seven variables in the model were endogenous since the model proposed that they were dependent on at least one other variable in the model. The model was recursive, as there were no feedback loops or reciprocal causations postulated between the variables. The model was not designed to be all-inclusive.

The model postulated that the variables knowledge, susceptibility to peer pressure, locus of control, and self-esteem affect sexual activity both directly and indirectly by acting through the variables of attitude toward AIDS and perceived vulnerability. The calculated path coefficients indicated the direction and strength of the hypothesized relationships. It was not surmised that attitude toward AIDS or perceived vulnerability had an effect on any variable other than sexual activity.
CHAPTER IV

RESULTS

The primary focus of this study was to replicate Hays's (1992) methodology and to extend the sample studied. The research question proposed in 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 hypothesis drawn from this research question were:

1. There will be no significant differences in the causal model for sexual activity between genders.

2. 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.

3. Adolescents' attitudes toward AIDS is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

4. Adolescents' perceived vulnerability is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control.

5. 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.

**Hypotheses**

**Hypothesis One**

To determine whether the subjects could be treated as one group or needed to be separated as a function of gender, and thus decrease the degrees of freedom in subsequent analyses, the initial analysis dealt with gender. In this study of 306 females and 223 males, there were 77 females (25%) and 74 males (33%) who reported having been sexually active. The number of females and the number of males found to be sexually active was not statistically significant \( \chi^2(4, N = 529) = 7.59, p < .01 \). As a result, it was not deemed necessary to conduct a separate path analysis for each gender, and the data were combined for further analyses.

**Hypotheses Two through Five—General Considerations**

Three sets of multiple regressions are shown in Tables 1, 2, and 3. These tables show the Beta values derived to test the independent variables with the selected dependent variable in the particular path under consideration. Table 1 contains the multiple regression on sexual activity, Table 2 contains the multiple regression on attitude, and Table 3 contains the multiple regression on perceived vulnerability. Under each table is listed 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 association between the listed variables.

Table 1
Beta Values, t-Values, and p Values for Sexual Activity

<table>
<thead>
<tr>
<th>Variable in Path Order</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.03</td>
<td>.79</td>
<td>.43</td>
</tr>
<tr>
<td>Perceived Vulnerability</td>
<td>.13</td>
<td>3.28</td>
<td>.00</td>
</tr>
<tr>
<td>Knowledge</td>
<td>.11</td>
<td>2.81</td>
<td>.00</td>
</tr>
<tr>
<td>Peer Pressure</td>
<td>-.46</td>
<td>-11.05</td>
<td>.00</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>.03</td>
<td>.63</td>
<td>.53</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>-.05</td>
<td>-1.19</td>
<td>.23</td>
</tr>
</tbody>
</table>

Note. R = .51. F(6, 458) = 27.43. p = .00.

Path analysis. The results of the regression analysis reveal that the predictor variables could account for about 26% of the variance in sexual activity, less than 6% of the variance in attitude toward AIDS, and less than 2% of the variance in perceived vulnerability. The data from the multiple regressions were then cast into the path analysis as shown in Figure 4.
Table 2
Beta Values, t-Values, and p Values for Attitude

<table>
<thead>
<tr>
<th>Variable in Path Order</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>-.00</td>
<td>-.09</td>
<td>.93</td>
</tr>
<tr>
<td>Peer Pressure</td>
<td>.03</td>
<td>.67</td>
<td>.50</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.02</td>
<td>-.46</td>
<td>.64</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>.22</td>
<td>4.66</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. $R = .22$. $F(4, 462) = 5.94$. $p = .00$.

Table 3
Beta Values, t-Values, and p Values for Perceived Vulnerability

<table>
<thead>
<tr>
<th>Variable in Path Order</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>.01</td>
<td>.14</td>
<td>.89</td>
</tr>
<tr>
<td>Peer Pressure</td>
<td>-.03</td>
<td>-.57</td>
<td>.57</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.10</td>
<td>-2.09</td>
<td>.04</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>-.01</td>
<td>-.19</td>
<td>.85</td>
</tr>
</tbody>
</table>

Note. $R = .11$. $F(4, 460) = 1.54$. $p = .19$. 
Figure 4. Path analysis for all subjects, significant paths in bold.

From the diagram presented in Hays's (1992), Figure 1, four hypotheses were proposed which related 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 analyzed and results relative to each hypothesis are presented following.

Hypothesis Two--Specific Results

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.
control. Results of the multiple regression on sexual activity were found to be significant. However, the data failed to replicate Hays (1992). Only 26% of the variance was accounted for, with knowledge, perceived vulnerability, and peer pressure being significant contributors to sexual activity.

Hypothesis Three--Specific Results

Adolescents' attitudes toward AIDS is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem, and locus of control. The data failed to replicate Hays (1992). Locus of control was found to be the only contributor to attitude toward AIDS, with slightly less than 6% of the variance on attitude accounted for.

Hypothesis Four--Specific Results

Adolescents' perceived vulnerability is a direct function of AIDS knowledge, susceptibility to peer pressure, self-esteem and locus of control. The data failed to replicate Hays (1992). Self-esteem was found to be the only contributor to perceived vulnerability, while Hays (1992) found knowledge, peer pressure, and self-esteem to contribute to perceived vulnerability. The regression equation accounted for less than 2% of the variance on perceived vulnerability.

Hypothesis Five--Specific Results

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. Locus of control was the only variable found to have a significant effect on attitude; however, attitude was not found to have a significant effect on sexual activity. Self-esteem was found to have a significant effect on perceived vulnerability. The data failed to replicate Hays (1992) and failed to support the hypothesis.

**Heuristic Analyses**

**Factor Analysis**

A factor analysis of the survey instrument was conducted to determine if items within each stated category are indeed independent. Results of the analysis, shown in Table 4, revealed three separate factors. Factor one is composed primarily of the knowledge and peer pressure variables; factor two is primarily composed of the attitude and locus of control variables; and factor three is primarily composed of the knowledge, self-esteem, and perceived vulnerability variables. The analysis also reveals that knowledge contributes significantly to both factors one and three. These results indicate that the questionnaire does not contain independent measures by item clusters.

**Alternative Regression Equations**

Multiple regression equations were run using question 35 and the sum of questions 34 and 35 to test for
statistical differences from Hays (1992) on the variables sexual activity, attitude, and perceived vulnerability. Inspection of the Beta weights did not seem to warrant a conclusion that the results on question 34 (ala Hays, 1992) were not representative of those obtained on question 35 or the sum of questions 34 and 35.

Table 4
Factor Analysis of Survey Instrument

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>.55</td>
<td>-.02</td>
<td>.57</td>
</tr>
<tr>
<td>Attitude</td>
<td>.04</td>
<td>.77</td>
<td>-.15</td>
</tr>
<tr>
<td>Peer Pressure</td>
<td>-.74</td>
<td>.15</td>
<td>.24</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-.21</td>
<td>.29</td>
<td>.62</td>
</tr>
<tr>
<td>Perceived Vulnerability</td>
<td>.17</td>
<td>.14</td>
<td>-.56</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>-.13</td>
<td>.74</td>
<td>.18</td>
</tr>
</tbody>
</table>

Alternative Variable Order

Variables were entered into the multiple regression equations based both on Hays’s (1992) hypothesis one (p. 69) and on her multiple regression equations (p. 75). Hays’s (1992) hypothesis one (p. 69) states: 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. Hays's (1992) multiple regression equations (p. 75) state: Sexual Activity (SA) = -0.17(LOC) +0.25(PP) -0.00(A) -0.16(PV) -0.10(SE) -0.05(K). Attitude (A) = -0.07(LOC) +0.03(PP) -0.33(K) +0.06(SE). Perceived Vulnerability (PV) = +0.01(LOC) +0.20(PP) -0.16(K) +0.16(SE). The additional analyses revealed that order of variable entry did not effect Beta weights.

Summary

Having failed to replicate Hays's (1992) Figure 1, the researcher developed Figure 4 to summarize the results of data that made contributions to the dependent variable, sexual activity. The p values shown in Table 1 were used to determine if the variable contributed significantly to sexual activity and those variables making significant contributions are identified in bold on the path model.
CHAPTER V

DISCUSSION AND RECOMMENDATIONS

As shown in Figure 4, 5 of the 14 pathways in Hays (1992) were supported by the path analysis. In accordance with Hays, perceived vulnerability and peer pressure directly influenced sexual activity, while self-esteem influenced sexual activity indirectly through perceived vulnerability. Contrary to Hays (1992), knowledge was also found to have a direct influence on sexual activity. Attitude was not found to be significantly related to adolescents' sexual activity. However, locus of control had a significant influence on attitude. These findings suggest that adolescents' sexual behavior is most strongly influenced by peer pressure, perceived vulnerability, and knowledge, respectively. Peer pressure was found to have a negative relationship to sexual activity suggesting that adolescents' who report being pressured by peers are not necessarily more likely to engage in sexual activity.

The extended sample size of the present study allows for generalizability of Hays's (1992) results. Although portions of the path model were not replicated, the investigator does not suggest the model is inaccurate. Rather, results of the factor analysis suggest that the survey instrument used does not measure the seven variables
independently, as proposed. Therefore, failure to replicate the path model may be indicative of the flawed instrument rather than the model itself.

**Recommendations**

It is clear that adolescents, because of their risk-taking behavior, are at risk of contracting the AIDS virus. Sexual activity is a direct route for the transmission of AIDS. Therefore, in an effort to prevent the spread of AIDS in adolescents, it is important to understand factors which influence sexual activity. Research addressing the factors influencing sexual decision making needs to be conducted in order to develop adequate AIDS prevention programs. Therefore, it is recommended that future studies be undertaken:

1. Further investigation and adaptation of the survey instrument is a reasonable next step in attempting to measure the variables influencing sexual activity. Using factor scores rather than raw scores or raw score sums may prove beneficial.

2. Replication of the study should be considered using random samples, extended geographical locations, and other school-age groups.

3. Further studies to investigate additional sources of influence on adolescents' sexual behavior should be conducted. The greater knowledge that can be obtained about
the realm of predictor variables, the more likely AIDS prevention efforts are to succeed.

4. Investigations should be conducted to study the effects of predictor variables relative to age. Are there differences in the type and magnitude of influences as a function of children's age?

5. Corollary risk behaviors in adolescents, like alcohol use and inappropriate social behavior, might prove fruitful as added sources for measuring the psychosocial factors.

With continued research, information becomes available that can be incorporated into AIDS prevention programs. Schools have an obligation to educate students about AIDS and AIDS prevention. Therefore it is recommended that:

1. Schools should educate students about factors found to be influential in adolescents' sexual decision making. By becoming informed about underlying factors influencing their behavior, it is hoped that students will make healthier decisions. In addition to knowledge about AIDS, the program needs to address perceived vulnerability and peer pressure.

2. Emphasis should be placed in the curriculum on increasing self-esteem and locus of control. Educators must recognize and understand the influence of self-esteem and locus of control in adolescents' sexual decision making.
3. Programs should be implemented that target the reduction of risk-behaviors associated with the transmission of the AIDS virus. These programs should provide adolescents with information, skills, and support conducive to adopting behaviors that will reduce the likelihood of infection.

Summary

The purpose of this study was to replicate Hay's (1992) methodology and extend her sample size. Replication of Hays's (1992) results would allow for generalization and would lend support to the path model of sexual activity she proposed. Of the six independent variables in the model, three were found to have a significant, direct relationship to sexual activity. Locus of control had a significant relationship to attitude, and self-esteem had an indirect relationship to sexual activity through perceived vulnerability. The most significant independent variable was peer pressure, which was a negative relationship, followed by perceived vulnerability, and knowledge. There were no significant gender differences in sexual activity. Factor analysis revealed the need for further work on the survey instrument. Targeting specific psychosocial factors influencing adolescents' behavioral choices, appears to provide direction for AIDS prevention education.
REFERENCES


APPENDIX A

Letter to Schools
March, 1993

Dear School Administrator,

I am a graduate student studying school psychology at the University of Northern Iowa and am currently writing a thesis as part of my program requirement. My thesis chair is Dr. Don Schmits at (319) 273-3384, should you desire to contact him. I am writing to request your consideration in allowing me to collect data from students in your school district.

The purpose of my study is to replicate the work of Hays (1992) addressing the AIDS-related risk behaviors of adolescents. The study will look at adolescents' knowledge about AIDS, attitudes toward AIDS, and several psychosocial characteristics related to the self-reported sexual activity of adolescents.

Sexually transmitted diseases, including AIDS, are mandated as part of the educational curriculum. Therefore, it is my intent to administer a questionnaire to ninth grade students enrolled in social studies. Teachers will be asked to read the directions to the students and the questionnaire will take approximately 15 minutes of one class period to complete.

I am enclosing a copy of my thesis proposal as well as a copy of the questionnaire I will be asking students to complete. Since I am attempting to replicate a previous study I am unable to change the questionnaire in any way. If this is unacceptable, I will be unable to collect data from students in your district. If, however, you find this topic to be of interest and likely to benefit your district and the students you serve, I would like to make an appointment with you to provide you with further information and discuss future plans. Consequently, I will call to set up an appointment with you and to answer any questions you might have.

Sincerely,

Erika Kumerow
112 F. St.
Cedar Falls, IA 50613
(319) 266-4864
APPENDIX B

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 "IT'S YOUR CHOICE"?
   a. YES    b. NO

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 infection 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 from 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 taking birth control pills?
   a. YES    b. NO    c. NOT SURE

30. Have you ever injected a (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 old or younger
   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 do you think the threat of AIDS is 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 you 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 C

Teacher Instructions
TEACHERS: Please read these instructions aloud after distributing the surveys to the students. Students should be asked to follow along as you read.

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 never 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 cause AIDS.

Place all your answers on the answer sheet. Fill in the circles completely. THANK YOU VERY MUCH FOR YOUR HELP!!!
APPENDIX D

Letter to Parents
Dear Parent:

The *** 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 social studies.

Social studies is required of all ninth grade students to meet the state curriculum standards. 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 of one class period.

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 social studies teacher by (date).

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

I am fully aware of the nature and extent of my child's participation in this project as stated above and the possible risks arising from it. I hereby agree to my child's participation in this project. I acknowledge that I have received a copy of this consent statement.

(Signature of Parent/Guardian) Date

(Printed name of Parent/Guardian)

(Signature of Researcher)
Dear Parent:

The *** 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 social studies.

Social studies is required of all ninth grade students to meet the state curriculum standards. 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 of one class period.

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 social studies teacher by (date).

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

----------------------------------------
I am fully aware of the nature and extent of my child's participation in this project as stated above and the possible risks arising from it. I hereby agree to my child's participation in this project. I acknowledge that I have received a copy of this consent statement.

(Signature of Parent/Guardian) Date

(Printed name of Parent/Guardian)

(Signature of Researcher)

KEEP THIS COPY FOR YOUR OWN RECORDS