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Academic Goals, Achievement, and Age at First Sexual Intercourse: Reciprocal Influences

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ACADEMIC GOALS, ACHIEVEMENT, AND AGE AT FIRST SEXUAL INTERCOURSE: RECIPROCAL INFLUENCES

by

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Paul Schvaneveldt

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ABSTRACT

Academic Goals, Achievement, and Age at First Sexual Intercourse: Reciprocal Influences

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This study examined the reciprocal relationship between the age of first sexual intercourse and academic goals and achievement. It was hypothesized that lower educational goals and achievement were likely to be associated with an adolescent who initiated sexual intercourse at a younger age than those with higher educational goals and achievement. It was also hypothesized that initiating sexual activity early would be associated with a decrease in subsequent academic achievement and goals. Possible explanations are that the costs of engaging in sexual intercourse (pregnancy and sexually transmitted diseases) may deter adolescents from initiating intercourse. Weak attachment to parents and future goals may increase the influence of negative peer associations as well. It is also possible that adolescents who engage in sexual intercourse experience a change in mind set against community standards, one being high academic achievement and goals.

This project analyzed data from the National Survey of Children (NSC), which is a national longitudinal sample of children aged 7 to 11 beginning in 1976, with additional data collection points in 1981 and 1987. A regression analysis examined the correlation of selected educational variables with the age of first sexual intercourse. The sample was then divided into two groups: those who had experienced voluntary sexual intercourse prior to the time of a data collection point and those who had not. I tests were performed to examine the difference in educational variables for virgins and nonvirgins in 1981 and 1987. To examine the change in educational goals and achievement that could have resulted due to the onset of sexual activity, an analysis of covariance was performed on educational variables that were measured at two points in time.

The results of this research confirm that reciprocal relationships exist between adolescent sexual activity and educational achievement and goals. Lower educational achievement and goals, measured at an earlier point in time, were related to a younger age of first sexual intercourse. Also, engaging in sexual intercourse was related to a decrease in subsequent educational goals and achievement. The relationship between lower academic achievement and goals and the age of first sex varied by race and gender. Black females showed the strongest association with educational variables and black males the least association. White females and white males both showed significant relationships between education and sexual activity. Sexual activity had the most impact on subsequent academic achievement, followed by educational goals.

(73 pages)

CHAPTER 1

INTRODUCTION

The purpose of this study is to examine the relationship between adolescent sexual activity and academic goals and achievement. It is hypothesized that involvement in sexual activity during early adolescence is related to lower academic goals and achievement at a later time. Also, youth with lower academic goals and achievement are more likely to be sexually active at a younger age. A reciprocal relationship may exist among these variables and is the focus of this study.

Adolescents who initiate sexual activity at younger ages are less likely to use contraceptives, and are at higher risks for unintended pregnancy and sexually transmitted diseases. It is estimated that 11% of all females between ages 15-19 become pregnant each year (Miller & Moore, 1991). Possible explanations for high levels of pregnancy are that many adolescents begin having sexual intercourse in their early and mid teens, and relatively few sexually active adolescents consistently use effective contraceptive methods.

Data from the 1988 National Survey of Family Growth indicated that 49.5% of all unmarried women ages 15-19 have experienced sexual intercourse (Forrest & Singh, 1990). Males experienced a higher rate of sexual activity of 60% among the same age group. The rates of sexual activity of very young adolescents are lower, with 5.4% of females and 16.6% of males being sexually active by age 15 (Hayes, 1987). By age 20, 83% of men and 73.6% of women were sexually active (Hayes, 1987). The mean ages of first sexual intercourse are 16.2 years for females and 15.7 years for males (Zabin &

Hayward, 1993).

Rates of sexual activity vary by race. By age 15, 12.1% of white males experience sexual activity compared to 42.4% of black males. This difference existed with females as well with 4.7% of white females and 9.7% of black females reporting sexual activity by age 15. By age 20, the racial difference in sexual activity still exists with 72% of white females and 84.7% of black females being sexually active. For males, 81.1% of white males and 93.9% of black males were sexually active by age 20 (Hayes, 1987). The median age of first sexual intercourse for black females is 16.5 years and 17.2 years for white females. For black males the median age of first intercourse is 14.1 years and 16.2 for white males (Rosenbaum & Kandel, 1990).

Previous research shows that the younger the age when teens initiate sexual intercourse, the less likely they are to consistently use an effective contraceptive device. Only 31% of sexually active females under age 15 used any method of contraception, compared to 62.3% of females over age 17. The rates are similar for males with 34% under age 15 and 48.5 over age 17 using any method of contraception. The rates of contraceptive use were lower for blacks than whites at all ages (Zelnik & Shah, 1983).

Early sexual activity often results in emotional problems. Kennedy (1991) stated that early sexual activity often leads to emotional hurt and decreased communication in a relationship. Also, many sexually active teens become self-centered and have less empathy for their partners.

Finally, Greenberg, Madger, and Aral (1992) found that women who were sexually active prior to age 15 were 1.7 times more likely to get a sexually transmitted disease (STD) than women initiating sexual intercourse after age 17. They were also four times more likely to report five or more sexual partners,

increasing their risk of contracting STDs.

Pregnancy and Education

Pregnancy is a possible consequence of adolescent sexual activity. Pregnancy has a negative effect on future educational attainment and goals for both adolescent mothers and fathers. Adolescents who became fathers reported lower educational goals and eventual educational attainment when compared to male adolescents who did not become fathers. Adolescent fathers experienced a school dropout rate of 41% compared to 14% of nonfathers. Also, fathers had a 65% high school completion rate when compared to 86% of non-fathers (Marsiglio, 1987). Black adolescent fathers were more likely to be employed and out of school, and stated lower educational goals than non-fathers (Hendricks & Montgomery, 1984).

High school completion rates of women who became pregnant in high school are lower than those for women who did not become pregnant while still attending high school. Mott and Marsiglio (1985) found that 95% of women aged 20-26, who were childless, had completed high school. This contrasts to only 53% of women of the same ages who became pregnant while still attending high school had completed high school. The age at which conception takes place also has an important influence on total educational attainment. Women who conceived prior to age 15 report completing 1.5 years less of education than women who conceived at age 16 or 17 (Waite & Moore, 1978).

The temporal ordering of the influence of adolescent parenthood is important to clarify. Marini (1984) found that the age of the mother at first birth negatively influences the eventual educational attainment of the mother. Birth at a young age may cause a young teen to limit her educational pursuits. This

influence may also act in the reverse direction in that high levels of educational attainment delay the age of first birth when compared to lower levels of educational attainment. Marini (1984) found that the most powerful direction of influence is from educational attainment to the age of birth. Higher levels of educational attainment influence the age of first birth in a positive direction more than the age of first birth influences educational attainment in a negative direction.

Sexual Intercourse and Education

Initiating sexual intercourse at a young age, especially prior to age 15, has a significant negative impact on subsequent academic goals and achievement (Billy, Landale, Grady, & Zimmerle, 1988; Jessor, Costa, Jessor, & Donovan, 1983; Mott & Marsiglio, 1985). This academic goal modification may occur because of a change in values against community standards, one being high academic achievement. Furthermore, lower academic goals and achievement have been shown to increase the likelihood of being sexually active at a younger age (Jessor & Jessor, 1975; Marini, 1984; Rindfuss, Bumpass, & St. John, 1980; Upchurch & McCarthy, 1990). This may occur because sexual activity is not viewed as bearing serious consequences on young adolescent's future academic pursuits.

Hypotheses

Academic achievement and goals, and age at first sexual activity are believed to influence one another in a reciprocal manner. It is hypothesized that lower academic goals and academic achievement are correlated with an early age of first sexual intercourse. This may be due to a perception that

sexual activity does not compromise future academic plans. It is also hypothesized that an early age of first sexual activity is associated with lower subsequent academic goals and achievement. It is also possible that a comprehensive change against social norms may occur prior to the onset of sexual activity in adolescence and be reinforced after initiating sexual activity. This problem behavior syndrome may alter academic goals, achievement, and eventual attainment. A possible interaction between sexual activity and lower academic variables provides the basis for studying a reciprocal relationship between academic achievement, attainment, and goals and the age of first sexual activity . This study examines the association of lower educational achievement and goals with the age of first sexual intercourse. Also, the age of first sexual intercourse is examined for its association with educational achievement and goals for a national longitudinal sample.

Rationale for Study

Previous research has examined the relationship between education and sexual activity in a one-way direction. The current study looks at this relationship in a bidirectional design in an attempt to show a reciprocal effect. Data from the National Survey of Children (NSC), a national longitudinal sample, are used in the analysis. The NSC is a random, national sample of the same subjects over an 11-year period, that is expected to yield valid results in relation to how these two major variables are associated.

In summary, early sexual activity may lead to decreased educational goals, achievement, and attainment. Lower commitment to parental expectations and furture goals, along with an increased influence from deviant peer groups, may stimulate a change in mind set that lowers the importance of

academic pursuits for adolescents. Also, lower educational goals, achievement, and attainment may lead to increased likelihood of sexual activity. This may result because the costs of engaging in sexual activity (pregnancy and sexually transmitted diseases) are perceived as low. Early sexual activity may also increase the risk for sexually transmitted diseases and pregnancy, and is associated with less frequent use of contraceptive methods.

CHAPTER II

REVIEW OF LITERATURE

This review first outlines research related to the main hypotheses about the reciprocal effects of educational variables and adolescent sexual intercourse. A review of research conducted on the alternative hypotheses and theoretical perspectives follow. Finally, a summary concludes this review.

The Association of Education on Sexual Activity

Education as an antecedent to sexual activity has been the subject of many investigations. It has been hypothesized that having lower academic goals, achievement, and attainment increases the likelihood of engaging in sexual intercourse. Possible reasons are that the costs of being sexually active are not as great for teens with lower academic achievement and expectations. Pregnancy is not viewed as a great threat to educational goals and attainment. Several articles that support these hypotheses are reviewed below.

A teenager's educational aspirations and achievement are hypothesized to be associated with his or her fertility behavior. A teenager with high educational goals and achievement is more likely to delay the initiation of sex, or be more likely to use contraception if sexually active, in order to decrease the chances of pregnancy and sexually transmitted diseases (Moore, Simms, & Betsey, 1986). It has been found that becoming pregnant while still a teenager reduces educational goals, achievement, and eventual attainment (Rudd, McKenry, & Nah, 1990). Also male and female high school students who perceived school as difficult were more likely to become pregnant by age 21 (Robbins, Kaplan, & Martin, 1985).

It has been theorized that prior to engaging in sexual activity, teens experience a change of mind set against community norms. One of the changes that often occurs is that adolescents devalue academic achievement, attainment, and goals. Research conducted by Jessor and Jessor (1975) demonstrates that there is a difference between virgins and nonvirgin adolescents in their attitudes towards regulatory norms or community standards. It is argued that this difference in mind set occurs prior to the transition from virginity to nonvirginity and is reinforced after initiating sexual activity. They found that nonvirgins have lower values on academic achievement, lower academic expectations, and lower parental control and direction than virgins.

Academic achievement has been found to affect the sexual activity of adolescents. A longitudinal study showed that poor academic performance at grade four significantly predicted sexual activity by grade nine (Capaldi, 1991). Students with lower school performance had higher rates of sexual activity as shown by several studies (Alaska State Office of the Commissioner, 1990; Donovan, Jessor, & Costa, 1988; Dorius, Heaton, & Steffen, 1993; Farrel, Danish, & Howard, 1992; Flamer & Davis, 1990; Furstenberg, Morgan, Moore, & Peterson, 1987; Hayes, 1987; Philliber & Tatum, 1982; Udry & Billy, 1987).

Specifically, Farrel et al. (1992) found a negative association between student grade point average and sexual activity. Those who were sexually active also had a lower grade point average than those who were not sexually active. Adolescents with higher grades and higher scores on intelligence tests were less likely to initiate sexual activity at younger ages (Hayes, 1987). Also, a comparison of teens' self-rank in academic performance showed a significant difference between those who had experienced sexual intercourse and those who had not. Only 33% of teens who were sexually active also had

above average school performance, when compared to 51.6% of teens who had not experienced sexual intercourse (Alaska State Office of the Commissioner, 1990).

Educational attainment is affected by sexual activity in that being sexually active increased the odds of dropping out of school significantly for males and females (Dorius et al.1993). For each additional year of education that a women attained, her age of first sexual activity was delayed by .75 years (Rindfuss et al. 1980). Women with more years of education reported a later age of first sexual intercourse (Wyatt, 1989).

Adolescents' educational and occupational goals are influenced by their parents' level of education in that higher levels of parents' education delayed the age of first sexual intercourse as reported by Rindfuss et al. (1980). To summarize their research hypotheses, a woman who has higher educational goals will postpone sexual activity and fertility. Women who experience early fertility usually alter their educational plans to accommodate the new role of motherhood. The rationale for such hypotheses is that girls with higher educational plans choose social patterns and activities that are less likely to lead to early sexual activity and fertility.

Important findings of the study conducted by Rindfuss et al. (1980) showed that the more years of education completed by a female, the less likely pregnancy occurred. They also found that the adolescent's level of education had a strong effect on the age of fertility. Over 40% of the mothers age 17 or less had already dropped out of school one year prior to becoming a mother. This indicates that educational goals and attainment had a strong influence on fertility-related behaviors.

Educational goals have been shown to influence sexual activity for males

and females. It is theorized that the costs of engaging in sexual activity affect subsequent educational goals. Small, Silverberg, and Kerns (1993) found that the costs of sexual activity, pregnancy and STDs, had a greater influence on sexual activity than perceived benefits of sexual activity. This difference was greater for females than males, probably due to greater costs of pregnancy for females.

Plans for higher education are related to the rate of sexual activity in that Scott-Jones and White (1990) observed that 50% of adolescents with no self-reported college plans were sexually active compared to 29% with college plans and 13% with graduate school plans. Miller and Simon (1974) also found that both males and females were two times more likely to be sexually active if they planned to stop their education before college. Specifically, for 16- and-17-year-old males, 31% of those not planning to go to college were sexually active, compared to 16% who were planning for college. For 16- and 17-year-old females, 39% not planning for college were sexually active when compared to 16% who stated a college education as a goal.

Peterson, Moore, and Furstenberg (1991) found that adolescents who reported goals of a college education had the lowest rate of sexual activity. Those who did not aspire to attend college had the highest rate of sexual activity. Kraft (1991) found the age of first sexual intercourse was significantly lower for those who manifested lower educational goals, when controlled for other socioeconomic variables. Others found that adolescents with higher educational goals experienced later ages of first sexual intercourse (Benda & DiBlasio,1991; Miller & Sneesby, 1988; Scott-Jones, 1991; Wyatt, 1989).

The opposite direction of this relationship has been shown as well. According to several studies, lower educational plans result in a greater rate of

sexual activity, at an earlier age (Handler, 1990; Hendricks & Montgomery, 1984; Hogan & Kitagawa, 1985).

In summary, education has an important association with adolescent sexual activity. Pregnancy and sexually transmitted diseases could be viewed as significant barriers against educational pursuits. Those who have lower academic goals and achievement may view sexual activity as less of a threat than adolescents with higher educational goals and achievement. Also, those who have a negative view of social norms may also view academic achievement as less important and may be more sexually active.

The Association of Sexual Activity on Education

Miller and Sneesby (1988) hypothesized that engaging in sexual intercourse leads to reduced educational interests. Billy et al. (1988) studied the relationship of sexual intercourse and academic goals and achievement. They compared sexual activity with educational attitudes and achievement in a longitudinal design at two time intervals. They found that white, virgin females at time one, who made the transition to nonvirginity before time two, decreased their cognitive appraisal of the importance of going to college, when compared to those who were still virgins at time two. There was a significant difference in school grades of virgin and nonvirgin white females. White female virgins who made the transition to nonvirginity before time two reported a significant decrease in school grades at time two, when compared to white females who did not make the transition to nonvirginity. Intercourse had no significant effect on academic attitudes and goals of white males, black males, or black females.

Other longitudinal studies that compared adolescents who made the transition to sexual activity with those who did not make the transition to sexual

activity found that nonvirgins reported lower values on academic achievement, lower educational goals, and less importance on parental guidance, when compared to virgins who did not make the transition to sexual activity (Jessor & Jessor, 1975). Research has also found that initiation of sexual intercourse significantly increased the odds of dropping out of school (Dorius et al. 1993). Specifically, women who were sexually active in their early teens were 70% more likely to drop out of school than teens who were not sexually active (Upchurch & McCarthy, 1990).

The early onset of sexual activity is associated with a syndrome of problem behaviors, including a change in academic achievement and goals. Research conducted by Jessor et al. (1983) showed that several educational variables changed as an adolescent initiated sexual activity. They found that a teen who made the transition to sexual activity placed a lower value on academic achievement and had lower expectations for academic achievement than teens who did not make the transition to sexual activity. It is probable that a devaluation of community norms, such as educational pursuits and social acceptance, leads to a perception that sexual activity does not incur great costs to the teenager who thus views sexual activity as a more desirable and acceptable activity.

Control Variables/Alternative Hypotheses

Parental education levels are positively related to adolescent academic achievement and goals. Kerckhoff and Huff (1974) theorized that educational goals are the outcome of socialization, mostly parental influence. Davies and Kandel (1981) investigated the influence of parents and peers on educational plans. The results of their study indicated that the parents' educational level

was the stronger influence on adolescent educational attainment and goals.

Miller and Sneesby (1988) found that father's and mother's educational attainment had a positive relationship to the adolescents' educational plans, perceptions of the importance of good grades, and self-report of school grades. All of these educational variables were found to be inversely related to sexual intercourse experience, except the mother's educational attainment. The results of the study show important relationships between the parents' level of education, student's educational plans or grades, and children's sexual activity.

Teachman (1987) tested the hypothesis that family educational resources, defined as the parents' level of education and socioeconomic status, had a positive impact on the educational attainment of children. It was believed that families with more resources would motivate their children to attain higher levels of education. The results showed that adolescent females with higher educational resources had more friends planning to attend college and higher educational goals than adolescent females from families with lower educational resources. Adolescent males from families with higher educational resources were found to report higher grades and higher educational goals as well. Ultimately, a family with high educational resources had a positive effect on college graduation. Thornton and Camburn (1987) also found similar results. Thus, parental education and gender are important control variables to be included in this study.

Another major impact on adolescent sexual activity is peer influence. It is believed that many adolescents engage in sexual intercourse due to peer associations. Billy and Udry (1985) found that the influence of peers is greatest for white females. In their longitudinal study, a virgin, white female, whose female best friend was a nonvirgin at time one, was six times more likely to have

intercourse at time two than a virgin whose female best friend was a virgin at time one. A white female virgin was three times more likely to make the transition to nonvirginity at time two when her best male friend was a nonvirgin at time one. When both male and female best friends were nonvirgins at time one, the likelihood of transition to nonvirginity was 18 times greater than for white females who had both friends as virgins at time one. There were no significant effects on white males, black males, or black females.

Other research has found a significant influence of peers on sexual activity for both males and females. DiBlasio and Benda (1992) found that peer influence explained 33% of the variance of sexual activity of adolescents for males and 27% of the variance for females. The influence of peers was statistically significant for both males and females. This research shows a significant influence of peers on white females. These studies also indicate that race and gender are important variables that may influence the relationships to be studied in the present research.

It has been shown in previous research that males engage in sexual intercourse at younger ages than females. The median age of first intercourse for females is 16.2 years and 15.7 years for males (Zabin & Hayward, 1993). Possible reasons for an older age of first intercourse for females are that parents' education level, religiosity, and other education variables have more influence on women than men (Udry & Billy, 1987). Also, the costs of engaging in sexual intercourse are greater for women than men due to risks of pregnancy and sexually transmitted diseases (Small et al. 1993). Biological explanations, such as testosterone (Udry, 1988), could also explain why males have a younger average age of first sex than females.

Race has consistently been identified as an important variable in

adolescent sexual activity. Blacks tend to initiate sexual activity at a younger age than whites, especially black males. Also, blacks experience more sexual activity than whites (Hayes, 1987). Specifically, Furstenberg et al. (1987) found that black females were four times more likely to have sex than white females and black males were two times more likely to have sex than white males. Some possible explanations for a younger age of first sexual intercourse and higher rates of sexual activity are that blacks may perceive fewer employment and educational opportunities. This could reduce the potential costs of sexual activity and result in the perception that the benefits of sexual activity are greater than the costs if there are few opportunities (Hogan and Kitigawa, 1985).

Other explanations are that black males find it difficult to define themselves through economic or educational means. Thus sexual activity provides a manner in which manhood or adult status can be attained (Bell, 1986). Furthermore, many social norms against sexual activity have diminished more for black communities than other communities. The social controls that may have prevented a black person from engaging in sexual activity at a younger age are less than for a white person (Bell, 1986; Billy et al., 1988).

Theoretical Framework

The main theoretical frameworks to be used in this project are attachment theory, differential association theory, social exchange theory, and problem behavior syndrome theory. These frameworks are used to refine hypothesis formulation and to guide in the selection of variables to be analyzed. Useful theories help to organize, categorize, and guide in the prediction and explanation of the research process. They are helpful in providing a sense of understanding to findings that emerge from the data.

Attachment Theory and Differential Association Theory

Previous research has demonstrated that parents exert a strong influence on their children's sexual activity. Several factors associated with bonding and attachment between parent and child are related to future academic pursuits and sexual activity. Hirschi (1969) argued that strong bonding between parents and child greatly influences commitment to future goals and societal norms. This in turn acts as a resiliency factor against negative peer influences. According to Hirschi (1969) there are four factors that affect the strength of the relationship between child and parent: (a) attachment, (b) commitment, (c) involvement, and (d) beliefs. Attachment or emotional commitment between parent and child is an influential factor related to the adoption of parental and community expectations. In most cases, parents have high educational and moral expectations for their children. As stated previously in this thesis, peers exert a strong influence on the sexual activity of adolescents. Strong attachment to parents often translates into a stronger commitment by adolescents to future educational goals and community standards, in that people often emulate behavior of those they esteem. This also acts as a resiliency factor that decreases the negative influences of sexually active peers on other adolescents (Benda & DiBlasio, 1994; DiBlasio & Benda, 1994; DiBlasio & Benda, 1992).

Other research also supports this theoretical model. Patterson (1986) argued that weak attachment between parent and child is often linked to an increased influence of peers toward deviant behaviors such as sexual activity. Poor attachment is often the result of coercive, inconsistent, and permissive practices. This is likely to result in a peer association with similar backgrounds

and expectations. Differential association theory postulates that persons with similar backgrounds and aspirations move towards each other and often participate in matching behaviors. The perception of the costs and rewards of deviant behaviors may change as a result of association with deviant peer groups. Social exchange theory outlines the rewards and costs incurred by sexual activity.

Social Exchange Theory

Nye (1979) and Boss, Doherty, LaRossa, Schumm, and Steinmetz (1993) outlined some of the basic assumptions of social exchange theory, stating that humans are rational, self-interested beings who seek to minimize costs and maximize rewards. A reward can be any satisfaction, gratification, relationship, status, experience, or feeling. A cost can be any feeling of dislike or a reward forgone, known as an opportunity cost. According to social exchange theory, humans evaluate the exchange between costs and rewards in a given situation, and are most likely to choose the alternative with the most rewards and the fewest costs.

The specific propositions relevant to this project were outlined by Nye (1979): "Lower class adolescents are more likely to marry and/or have children before their 20th birthday than are adolescents from middles-class families according to the theory" (p. 17). The rationale this proposition is that lower-class parents are less likely to view early marriage as a threat to the educational and occupational goals of their adolescents. These parents are believed to have lower expectations and fewer resources to control their children.

The propositions further detail the antecedents of marriage and childbirth. "Adolescents who view early marriage and parenthood as non-

threatening to their educational and occupational goals are more likely to marry early" (Nye, 1979, p. 17). This relationship may be influenced by parents who view early marriage and childbirth as nonthreatening to their children's educational and occupational goals. Thus, they are less likely to oppose the marriage and childbirth of their adolescent.

This leads to further proposals of social exchange theory. "Adolescents whose parents view early marriage and childbirth as non-threatening to their children's occupational and educational goals are more likely to engage in unprotected intercourse" (Nye, 1979, p .17). Thus," the lower the perceived costs of sexual intercourse between persons not married to each other, the less close the chaperonage of adolescents by parents" (p. 18).

There is empirical evidence to support the hypotheses outlined by Nye (1979). A study by Small et al.(1993) found that the perceived costs of sexual activity act as a great deterrence to sexual activity. The greatest costs were jeopardizing future educational and occupational goals due to pregnancy and STDs. Thornton and Camburn (1987) found that parents with higher levels of education had children who had a lower level of sexual activity probably because highly educated parents exert more control over their children not to engage in sexual activity. Early sexual activity may be viewed as a threat to future educational plans.

Racial and gender differences in the age of first sexual activity may be a result of different perceived costs. Bauman and Udry (1981) stated that teens who were sexually active had fewer perceived costs of early sexual activity than teens who were not sexually active. They stated that the difference in costs were much lower for blacks than whites, and lower for males than females. Females experience higher costs of engaging in sexual activity than males due

to pregnancy. This could explain their perception of more costs in engaging in sexual activity. Blacks may perceive fewer educational and occupational opportunities than whites and the costs of pregnancy may be viewed with less importance (Bell, 1986; Forste & Heaton, 1988; Furstenberg et al., 1987).

Problem Behavior Syndrome Theory

Problem behavior syndrome theory assumes that there is a fundamental change of the mind set in an adolescent against community norms and standards associated with engagement in problem behaviors. Research has established that youth tend to become involved in a set of highly interrelated problem behaviors, including the use of alcohol, tobacco, other drugs, delinquency, and early sexual activity (Donovan et al. 1988; Elliot & Morse, 1989; Farrel et al.1992; McLean & Flanigan, 1993; Peterson et al., 1991; Rosenbaum & Kandel, 1990; Whitbeck, Conger, Simons, & Kao, 1993). The change of mind set that is of concern in this project is a decreased value on academic achievement, goals, and attainment. Research provides evidence that adolescents who experienced involvement in sexual activity also had a lower value on academic goals and lower academic achievement (Jessor & Jessor, 1975). Also, once the transition from virginity to nonvirginity has occurred, adolescents continue to report a lower level of academic achievement and a lower value on academic achievement (Jessor et al., 1983).

In summary, parents with higher levels of education view early sexual activity and pregnancy as a greater cost toward their children's educational and occupational pursuits, when compared to parents with lower levels of education. Also adolescents with higher educational achievement and goals are more likely to postpone sexual activity to an older age than teens with lower

educational achievement and goals. Problem behavior syndrome theory postulates that there is a fundamental change associated with the onset of problem behavior and this continues after the behavior is initiated.

Summary

Lower academic achievement and educational goals have been found to increase the likelihood of the onset of sexual activity. Alternatively, the onset of sexual activity has been found to have a negative effect on educational goals and attainment. To review the alternative hypotheses, the education level of the parents has a strong, positive impact on adolescent educational goals and academic achievement. Also, peers exert a strong influence on sexual activity. Race and gender differences also are important in understanding peer and parental influences. Race and gender differences also affect the age of first sexual intercourse.

Previous research has clearly shown a relationship between the age of first sexual intercourse and educational achievement and goals. It has been shown that the higher one's educational goals and achievement, the more likely one is to engage in sexual activity at an older age than an adolescent who has lower educational goals and achievement. Also, it has been demonstrated that engaging in sexual activity at a younger age decreases future academic achievement and goals.

Hypotheses

This study focuses on the relationship between the age of first sexual intercourse and educational variables in a reciprocal design, hypothesizing that the age of first sexual intercourse and academic achievement and goals

are associated with one another. Attachment and peer associations have been the subject of several studies and empirical evidence supports these theories. This study focuses specifically on the relationship between the initiation of sexual intercourse and educational goals and achievement. The formal hypotheses that emerge from previous research used in the current study are:

Hypothesis One: Adolescents with higher levels of educational achievement, goals, attainment, and parents' with higher levels of educational attainment, experience a later age of first sexual intercourse.

Hypothesis Two: Adolescents who experience sexual intercourse at a younger age have lower educational goals, achievement, and attainment than adolescents who experience sexual intercourse at an older age.

CHAPTER III

METHODOLOGY

Definitions

The variables used in this study are defined as follows. The age of first sexual activity is defined as the age that an adolescent first experienced voluntary sexual intercourse retrospectively reported in 1987. Educational goals are the number of years of education that the adolescent hopes and expects to eventually attain. This variable was measured in 1981 and in 1987 and ranges from 1 to 5, with 1 being "quit school now" to 5 as "graduate school." The parents' expectations for the number of years of education their child will complete were measured using the same categories. Educational attainment is the number of years of school completed by the child in 1987. In all three waves of data collection, the children were asked to rank themselves with other students in their school. This academic rank variable ranges from 1 to 5 with 1 being one of the worst students to 5 being one of the best students. Parents also ranked their children with other students in their school in 1976 and 1981. Other educational variables are the child's self-report interest in school in 1981 and the child's proficiency in English in 1981. The parents' education is defined as the number of years of education completed by the mother or father. Race is defined as black or white, and gender as male or female.

Research Question

The two main questions to be addressed are: (a) whether one's

previously measured academic values and achievement is related to the age of first sexual intercourse; (b) whether the onset of sexual activity is related to academic values and achievement.

Sample

The data used in this project were obtained from the National Survey of Children (NSC), a three-wave multistage stratified probability sample of children living in the continental United States in 1976, 1981, and 1987. The original survey was designed to assess the social, physical, and psychological characteristics of United States children and their families. Respondents to the interviews were children, the primary caretaker (usually the mother), and one school teacher. Teacher data were not used in this project because there were over 200 missing cases. Black households were oversampled to attain a sample of black children of approximately 500 in 1976, but black children were less likely to be retained over time in the longitudinal sample.

The first wave in 1976 was based on a national probability sample of households with children ages 7 to 11. Information was gathered from 2,301 children in 1,747 households. Personal interviews were conducted with each child and the most knowledgeable parent available. The second wave of the survey occurred in 1981 and interviews were mostly conducted by telephone. The youth were 12-16 years old at this time. Information was gathered on only 1,423 of the same children or 62% of the original sample, due to budget limitations. The third and final wave was collected in 1987 where 1,145 of the youth from 1981 were reinterviewed. At this time their ages ranged from 18 to 23. The base number of cases used in the present study was 1,145. The attrition of subjects over the three waves was considerable. As in most

longitudinal surveys, it was greatest among youths from disadvantaged backgrounds. Even though some oversampling of blacks occurred, some parts of the population may be underrepresented.

It is possible that there may be an underreporting of sexual activity for 16-year-old females. Only 20% of 16-year-old females reported sexual activity when compared to 38% reported by Zelnik and Kanter (1980). It is possible that the timing of the 1981 survey may account for part of this discrepancy. The 1981 survey took place when the majority of the 16-year-old females were in the first half of their 16th year. Also, Zelnik and Kanter's sample represents an urban population whereas the NSC represents the entire country.

The adolescents' educational achievement was measured at all three times and thus facilitates a longitudinal and reciprocal examination with the age of first sexual intercourse reported retrospectively in 1987. The children's educational goals were measured in 1981 and 1987 and can also be examined in a similar method. Key control variables such as the parents' educational level, race, and gender are included to control alternative hypotheses.

Measurement of Variables

The NSC measured the child's academic achievement in a variety of ways in 1976. Children reported their proficiency in varied subjects such as art, reading, handwriting, spelling, writing composition, gym, math, science, and music. These variables were not included in the present analysis due to a large amount of missing data. In many of the schools, these subjects were not offered and data could not be collected on these individuals. These data were missing and were unavailable for analysis. In 1981 a similar format was used, although the terms for the subjects differed. The children were asked to rate their

proficiency at math, English, social studies, art, music, and science. Again due to large amounts of missing data for the various school subjects, only English was retained in the analysis. In all three waves, academic achievement was measured by asking the children to rank themselves as "one of the worst students, below average, average, above average, and one of the best." This facilitates a longitudinal measure of the students' academic achievement before initiating sexual intercourse until after the transition to sexual activity.

Parents' perceptions of their child's academic achievement was recorded in the 1976 and 1981. The parent was asked to rate their child's position in their class as "near bottom, below middle, in the middle, above the middle, and one of the best." Also the parents' expectations of their child's education was measured in the 1976. The parents were asked how far they expected their child to really go in school. The categories of response were "get some high school, graduate from high school, get some post high school education, graduate from college, and graduate school."

The child's academic goals were measured in 1981 and 1987. In 1981 the children were asked to report their goals in terms of what they would like to happen about school. The response options were to "quit school as soon as possible, finish high school, get some college or other training, finish college, and take further training after college." In 1987, the youth were asked to indicate how far they thought they actually would go in school. The categories included: "as far as I have already gone, quit school as soon as possible, finish high school, get some training beyond high school (not college), attend college for a year, attend college for two years, attend college for three years, graduate from college, get a master's degree, get a professional degree, or other." This was recoded into five categories similar to the 1981 variable in order to have

comparable variables across surveys.

The age of first intercourse was measured in 1987. The youth were asked to report their age at first voluntary sexual intercourse. This information was combined with adolescent marriage data to identify the age of first non-marital sexual intercourse. The variable ranged from 1 to 8 as first voluntary sex at: (1) age 12 or younger; (2) at age 13; (3) at age 14; (4) at age 15; (5) at age 16; (6) at age 17; (7) at age 18 or older; (8) virgins at the time of the interview or virgins when married.

Parents' highest level of education was measured in 1976 . The parent provided the highest grade or year of school completed for both the mother or the father, which ranged from 0 to 17 or more years. The parent with the higher level of education was chosen in the analysis.

Race was measured as Black, White, Oriental, American Indian, Hispanic, or other. Due to the small number of respondents who were Oriental, American Indian, Hispanic, or other, (n=24), they were not included in the analysis. Gender was measured as male or female in 1987.

Analysis Plan

Initially, a frequency distribution was run on all of the variables to attain a broad overview of the data. A hierarchical multiple regression was conducted on each education variable with the age of first sexual intercourse as the dependent variable for 1976 and 1981 variables. A regression analysis was not performed using 1987 independent variables because most of the sample by 1987 had already experienced sexual intercourse (N=886). Also, peer effects were not included as control variables due to their confounding effects on education. This analysis shows the relationship of educational achievement

and goals on the age of first sexual intercourse.

A separate analysis examines the relationship of the age of first sexual intercourse with subsequent educational variables. The sample was divided into two groups. The first group consisted of virgin adolescents and the second group of nonvirgin adolescents when interviewed in 1981. The academic goals and academic achievements were compared by a *t* test for the two groups by gender and race. The same analysis was done comparing virgins and nonvirgins for variables in 1987.

In order to examine the relationship of the transition to sexual activity with educational goals, achievement, and outcomes, a design used by Thornton and Camburn (1989) is utilized. First, the sample was divided into four groups. The first group were virgins in 1981, and the second group reported their transition to sexual intercourse between 1976 and 1981. The third group were virgins in 1987, and the fourth group made the transition to sexual activity between 1981 and 1987. If the transition to sexual intercourse was negatively associated with educational variables, then it would be expected that group two would report lower educational goals, achievement, and attainment than group one in 1981 and group four would report lower scores on educational variables than group three in 1987.

An analysis of covariance (ANCOVA) was then performed with educational variables as the dependent variables, the age of first sexual intercourse as a factor, and previous measures of education and gender as covariates. Race was not included in this analysis due to the small number of blacks (n=13) in a cell when compared to whites (n=411). Those who were virgins when married were not included in this analysis.

CHAPTER IV

RESULTS

Descriptive statistics for all of the variables are presented in Table 1. The mean age of first sexual intercourse for black females is 16.65, for white females 16.97, black males 15.91, and white males 16.60. The sample consisted of 50.4% females and 49.6% males; 21.4% black and 78.6% white.

Table 2 shows a Pearson correlation matrix between age of first sexual intercourse before marriage and all other variables. The table shows results separately for males and females. In a separate analysis done with the whole sample, gender correlated in a positive direction with the age of first sex at .1482 with a probability of less than .000, indicating that females were more likely to experience their first sexual intercourse at an older age than males. Race correlated negatively for males and females, meaning that blacks were more likely to initiate sexual activity at a younger age than whites.

Parents' educational level was positively correlated with the age of first sexual intercourse for both males and females, indicating that the higher the level of education of the parent, the older the child's age of first sex. The parents' rating of their child's academic performance for males in 1976 was not significantly correlated with the age of first sex, but was significantly correlated in 1981. A significant correlation was found between the parents' rating of their child's academic performance and the age of first sex in 1976 and 1981 for females. It appears that a higher rating in 1981 is related to a later age of first sexual intercourse for males. Also a higher parent rating in both 1976 and 1981 appears to delay the onset of sexual intercourse for females. Parents' expectations for the children's education was significantly related to a later age

Table 1

Descriptive Statistics for all Variables in the Analyses

Variables	Males		Females	
	Mean	SD	Mean	SD
Age at First Sexual Intercourse	5.68	1.89	6.17	1.50
Gender	1.0		2.0	
Race (0= black, 1=white)	.79	.41	.78	.41
Highest level of Parents' Education	12.61	2.61	12.58	2.45
Parents' Rating of Child's Academic Achievement in 1976	3.63	.98	3.92	.96
Parents' Rating of Child's Academic Achievement in 1981	3.46	1.09	3.70	1.02
Parents' Educational Expectations in 1976	3.22	1.10	3.16	1.03
Child's Academic Achievement in 1976	3.65	1.07	3.82	.97
Child's Academic Achievement in 1981	3.40	.97	3.46	.85
Child's Academic Achievement in 1987	3.48	1.02	3.65	.94
Child's English Performance in 1981	1.93	.65	2.15	.61
Child's Highest Grade Completed in 1987	12.25	1.60	12.49	1.53
Child's Interest in School in 1981	2.47	.61	2.59	.57
Child's Educational Goals in 1981	3.51	1.07	3.58	1.01
Child's Educational Goals in 1987	3.80	.90	3.86	.90

of first sex for females but not for males.

The child's self-rank of academic performance was positively correlated with the age of first sexual intercourse, indicating that for both males and females at all three times of data collection (except for females in 1976), a higher self-rank is associated with a delay in the age of first sexual intercourse.

The child's proficiency of English in 1981 was significantly correlated for females with the age of first sex, but not for males, indicating that the higher females rate themselves in English, the older their age at first intercourse. The highest grade completed in 1987 was positively correlated with the age of first sexual intercourse for both males and females indicating that the more years of education completed by 1987, the older the age of first sexual intercourse.

Table 2

Pearson Correlation of All Variables with Age of First Sexual Intercourse by Gender

Variable	Males			Females		
	r	p	(n)	r	p	(n)
Race (0= black, 1= white)[a]	-.242	.000	547	-.138	.001	559
Highest Level of Parent's Education	.221	.000	547	.235	.000	559
Parents' Rating of Child's Academic Achievement in 1976	.032	.445	543	.119	.005	558
Parents' Rating of Child's Academic Achievement in 1981	.129	.003	544	.139	.001	556
Parents' Educational Expectations in 1976	.073	.094	526	.190	.000	546
Child's Academic Achievement in 1976	.087	.042	542	.037	.378	557
Child's Academic Achievement in 1981	.099	.021	538	.103	.015	549
Child's Academic Achievement in 1987	.221	.000	545	.251	.000	558
Child's English Performance in 1981	.078	.069	534	.157	.000	548
Child's Highest Grade Completed in 1987	.271	.000	546	.286	.000	558
Child's Interest in School in 1981	.028	.517	538	.158	.000	549
Child's Educational Goals in 1981	.045	.291	536	.169	.000	547
Child's Educational Goals in 1987	.175	.000	433	.244	.000	472

[a] The Pearsons' correlation between race and age of first sexual intercourse is equivalent to a point biserial correlation.

The children's report of their interest in school in 1981 was not significantly correlated with the age of first sex for males, but was for females. It appears that the more interest a female expressed in school, the older her age of first sexual intercourse. Educational goals reported in 1981 and 1987 were positively correlated with age of first sexual intercourse for females in both years and for males in 1987 only. It thus appears that having higher educational goals is associated with an older age of first sex. In summary, most of the educational variables were correlated with the age of first voluntary sexual intercourse in the expected direction. This was more true for females than males; among females all but 2 of 14 correlations were statistically significant as expected, compared to 6 of 14 that were nonsignificant among males.

In many previous studies gender and race have been shown to be important variables that are associated with the age of first sexual intercourse. To examine this in the present study the sample was divided into four groups: (a) black females; (b) black males; (c) white females; and (d) white males. Table 3 presents the results of a correlation matrix of black females and black males with the age of first sex as the dependent variable. Table 4 presents the results of a correlation matrix of white females and white males with the age of first sex as the dependent variable.

Table 3 presents the results of all educational variables correlated with the age of first sex for black females and Males. Parents' educational expectations for black females were highly correlated with the age of first sexual intercourse at .3715, which means that the higher parents' educational expectations for their daughter, the older her age of first sexual intercourse. Black females' educational goals, self-rank of academic achievement at time three, and their educational outcomes were positively correlated with the age of

Table 3

Pearson Correlation of All Variables with Age of First Sexual Intercourse, Black Respondents by Gender

	Black Females			Black Males		
Variables	r	p	(n)	r	p	(n)
Highest Level of Parents' Education	.153	.092	122	.024	.796	114
Parents' Rating of Child's Academic Achievement in 1976	.139	.127	121	-.109	.248	113
Parents' Rating of Child's Academic Achievement in 1981	.092	.316	120	.090	.342	112
Parents' Educational Expectations in 1976	.371	.000	118	-.001	.986	109
Child's Academic Achievement in 1976	-.054	.554	120	-.040	.669	112
Child's Academic Achievement in 1981	.062	.506	115	-.071	.455	113
Child's Academic Achievement in 1987	.234	.009	122	.066	.484	114
Child's English Performance in 1981	.208	.025	115	.047	.619	112
Child's Highest Grade Completed in 1987	.246	.006	121	.180	.054	114
Child's Interest in School in 1981	.101	.279	115	.051	.589	113
Child's Educational Goals in 1981	.326	.000	115	.006	.950	112
Child's Educational Goals in 1987	.284	.004	102	.084	.431	90

first sex. No educational variables were significantly related to black males' age of first intercourse.

Table 4 presents the results for white females and males. All parent variables were positively correlated with the age of first sexual intercourse for white females, which means that parents with higher levels of education, a higher ranking of their child's academic achievement, and higher educational expectations were more likely to have daughters with an older age of first

Table 4

Pearson Correlation of All Variables with Age of First Sexual Intercourse, White Respondents by Gender

Variables	White Females r	p	(n)	White Males r	p	(n)
Highest Level of Parents' Education	.224	.000	437	.205	.000	433
Parents' Rating of Child's Academic Achievement in 1976	.103	.030	437	.027	.568	430
Parents' Rating of Child's Academic Achievement in 1981	.131	.006	436	.106	.028	432
Parents' Educational Expectations in 1976	.114	.018	428	.066	.175	417
Child's Academic Achievement in 1976	.069	.146	437	.136	.005	430
Child's Academic Achievement in 1981	.108	.024	.434	.149	.002	425
Child's Academic Achievement in 1987	.245	.000	436	.258	.000	431
Child's English Performance in 1981	.135	.005	433	.093	.056	422
Child's Highest Grade Completed in 1987	.296	.000	437	.269	.000	432
Child's Interest in School in 1981	.192	.000	434	.055	.253	425
Child's Educational Goals in 1981	.119	.013	432	.058	.228	424
Child's Educational Goals in 1987	.229	.000	370	.187	.000	343

sexual intercourse. White females' self-rank of their academic achievement in 1981 and 1987, and self-rank in English in 1981 were positively correlated with an older age of first sexual intercourse. Educational goals in 1981 and 1987, and educational outcomes in 1987 were positively correlated with age of first sexual intercourse for white females as well. Finally, a self-report regarding interest in school 1981 was correlated in a positive direction with the age of first sexual intercourse for white females, which means that a white female who

reports a higher level of interest in school was more likely to delay her onset of sexual activity.

For white males, parents' level of education is correlated in a positive direction with the age of first sexual intercourse. White males' self-rank of their academic achievement at all three times was positively correlated with the age of first sexual intercourse as well. Their self-rank of English was marginally correlated with a p-value of .056. Finally, educational outcomes and educational goals in 1987 were positively correlated with an older age of first sexual intercourse for white males. In summary, racial and gender differences resulted in different results for the association with education and the age of first sexual intercourse. White females showed the most correlation, with 10 educational variables significantly correlated to the age of first sex. White males had 7 educational variables significantly correlated with the age of first sex, and black females had 6. No educational variables were correlated with the age of first sexual intercourse for black males.

The Association of Educational Variables on the Age of First Sexual Intercourse

Tables 5 through 9 show the regression results of the educational variables with the age of first sexual intercourse as the dependent variable. Table 5 shows the standardized (beta) regression coefficient results for all subjects; Table 6 shows the results of black females; Table 7 shows the results of white females; Table 8 presents the results of black males; and Table 9 shows the results of white males.

For all subjects, it appears that the parents' level of education, race, child's interest in school, and self-report of English proficiency were significant

Table 5

Standardized Regression Coefficients for All Subjects (N=1060) and Age of First Sexual Intercourse

Variable	Model 1	Model 2	Model 3	Model 4
Highest Level of Parents' Education	.180***	.167***	.152***	.159***
Race	-.131***	-.144***	-.132***	-.140***
Parents' Educational Expectations in 1976		.017		.003
Child's Educational Goals in 1981		.021		.002
Child's Interest in School in 1981		.112***		.092**
Child's Academic Performance in 1976			.048	.048
Child's Academic Performance in 1981			-.001	-.016
Parents' Rating of Child's Academic Achievement in 1976			-.032	-.030
Parent's Rating of Child's Academic Achievement in 1981			.072	.058
Child's English Performance in 1981			.086**	.073*
R-Square	.065***	.080***	.082***	.089***

* p <.05 ** p <.01 *** p <.001

factors in predicting the age of first sexual intercourse. The R-square for the entire model is .0899 with a significance of .0000. The child's self-rank and parents' rating of child's academic ability did not contribute to the model significantly. Also educational goals did not contribute to the explanation of the age of first sexual intercourse.

As shown in Table 6, the level of parents' education was not a very important predictor of age at first sex for black females. Instead, parents' educational expectations, child's educational goals, and the child's interest in

Table 6

Standardized Regression Coefficients for Black Females (n=112) and Age of First Sexual Intercourse

Variable	Model 1	Model 2	Model 3	Model 4
Highest Level of Parents' Education	.153	-.055	.1075	-.052
Parents' Educational Expectations in 1976		.325**		.351**
Child's Educational Goals in 1981		.238*		.222*
Child's Interest in School in 1981		.052		.048
Child's Academic Achievement in 1976			-.129	-.121
Child's Academic Achievement in 1981			-.001	.010
Parents' Rating of Child's Academic Achievement in 1976			.107	-.041
Parents' Rating of Child's Academic Achievement in 1981			-.007	-.054
Child's English Performance in 1981			.188	.143
R-Square	.023	.193***	.077	.226**

*p<.05 ** p<.01 **p<.001

school in Model 2 explained nearly 20% of the variance in age of first sexual intercourse for black females. The most important variables were the parents' educational expectations for their children with a beta of .3205, and the child's educational goals in 1981 with a beta of .2383. These variables maintained their importance when included in the entire model. The parents' educational expectations showed a beta of .3510 and the child's' educational goals in 1981 showed a beta of .2222. The R-square for the entire model for black females was .2262 with a significance of .0014. It appears that the parents' expectations for their daughters' education and educational goals were especially important

variables in predicting the age of first sexual intercourse for black females.

The most important factors for white females were their parents' level of education and self-reported interest in school in 1981. In the second model, the parents' level of education had a beta of .2297, and the child's interest in school had a beta of .2045. These two variables, along with the parents' educational expectations for their children and the child's educational goals, explained over 9% of the variance in the age of first sexual intercourse for white females. This indicates that the higher the level of parents' education and the higher the daughter's interest in school at time two, the less likely a white female initiated

Table 7

Standardized Regression Coefficients for White Females (n=427) and Age of First Sexual Intercourse

Variable	Model 1	Model 2	Model 3	Model 4
Highest Level of Parents' Education	.224***	.229***	.193***	.226***
Parents' Educational Expectations in 1976		.010		-.008
Child's Educational Goals in 1981		.007		-.000
Child's Interest in School in 1981		.204***		.196***
Child's Academic Achievement in 1976			.028	.031
Child's Academic Achievement in 1981			.000	-.041
Parents' Rating of Child's Academic Achievement in 1976			.004	.006
Parents' Rating of Child's Academic Achievement in 1981			.049	.042
Child's English Performance in 1981			.082	.036
R-Square	.050***	.093***	.064***	.096***

p***< .001

sexual activity at a younger age. The R-square for the model is .0965 with a significance value of .0000 with parents' education and child's interest in school as the most important factors.

No variables in these models were statistically significant predictors of the age of first sexual intercourse for black males. This is consistent with previous research attempts (Hayes, 1987). This shows that educational variables are not good predictors of the age of first sexual activity for black males.

Table 8

Standardized Regression Coefficients for Black Males (n=107) and Age of First Sexual Intercourse

Variables	Model 1	Model 2	Model 3	Model 4
Highest Level of Parents Education	.024	.045	.030	.028
Parents' Educational Expectations in 1976		-.029		.049
Child's Educational Goals in 1981		.063		-.044
Child's Interest in School in 1981		-.014		.038
Child's Academic Achievement in 1976			.003	.001
Child's Academic Achievement in 1981			-.103	-.117
Parents' Rating of Child's Academic Achievement in 1976			-.142	-.158
Parents' Rating of Child's Academic Achievement in 1981			.142	.143
Child's English Performance in 1981			.064	.068
R-Square	.001	.004	.039	.044

Table 9

Standardized Regression Coefficients for White Males (n=414) and Age of First Sexual Intercourse

Variable	Model 1	Model 2	Model 3	Model 4
Highest Level of Parents' Education	.205***	.227***	.183***	.216***
Parents' Educational Expectations in 1976		-.035		-.032
Child's Educational Goals in 1981		-.024		-.075
Child's Interest in School in 1981		.055		.026
Child's Academic Achievement in 1976			.130*	.135*
Child's Academic Achievement in 1981			.102	.116
Parents' Rating of Child's Academic Achievement in 1976			.117*	.014
Parents' Rating of Child's Academic Achievement in 1981			.020	.027
Child's English Performance in 1981			.023	.025
R-Square	.042***	.045***	.071***	.077***

* $p < .05$ ** $p < .01$ *** $p < .001$

Important factors in explaining the age of first sexual activity for white males were their parents' level of education and the childs' self-rank of academic ability, especially in 1976. The highest level of education completed by a parent had a beta of .2162 and was statistically significant at .0001 with the full model. White males' self-rank of academic performance at time one had a beta of .1351 with a significance value of .0116. The R-square for the equation was .0774 and the significance of the F was .0001. This indicates that a higher level of parents' education and a higher self-rank of academic achievement in 1976 is related to a delay in the age of first sexual intercourse for white males.

In summary, educational variables explained the most variance in the age of first sexual intercourse (22.6%) for black females with the parents' educational expectations for their daughters and the child's educational goals as the most important variables. Educational variables, especially the parents' level of education and the child's interest in school, explained 9.7% of the variance in the age of first sexual intercourse for white females. For white males, educational variables explained 7.7% in the variance of the age of first sexual intercourse, with parents' education and the child's self-rank of academic achievement as the most important variables. The regression analyses did not significantly explain the variance of the age of first sex for black males. It appears that other factors, which were not included in this analysis, explain the age of first sexual intercourse for black males.

The Association of the Age of First Sexual Intercourse on Educational Variables

The focus now shifts to the second research hypothesis: Is having sexual intercourse as a teenager related to educational goals and achievement measured at a later point in time? To begin answering this question, the sample was divided into two parts; one group that had experienced sexual intercourse prior to the interview and another group that had not experienced sexual intercourse prior to the interview. A *t* test was then performed to compare the educational variables for these two groups. It is important to note that this analysis does not explain the temporal ordering of the age of sexual activity and academic goals and achievement, but rather shows the difference in educational variables for those who had experienced sexual intercourse and those who had not. At a later point in this paper, the results of an analysis of

covariance that examined the change in academic variables as a result of the initiation of sexual intercourse are presented. The results of *t* tests that examined the difference in educational variables between virgins and nonvirgins in 1981 and in 1987 are presented in Tables 10 through 12. The results are presented for the whole sample and by race and gender.

The ages of the children in the sample ranged from 12 to 17 in 1981 and from 18 to 22 in 1987. For this reason, in 1981 the majority of the children had not made the transition to sexual activity since the mean age of first sex in this sample is 16. In 1987, most of the adolescents/young adults had initiated sexual activity. For this reason the size of the groups of virgins and nonvirgins at each time is unbalanced in opposite directions.

In 1981, the nonvirgins had significantly lower scores than virgins for all educational variables. The difference was greatest for the parents' rating with a *t* value of 4.34, indicating that the higher the parents' rating of their child at time two, the more likely they were to report being a virgin at that time. The childs' interest in school also showed an important difference between virgins and nonvirgins in 1981. This means that if one expressed a higher interest in school in 1981, they were also less likely to have experienced sexual intercourse at that time.

In 1987 (see Table 10), the virgins had a significantly higher self-rank of their academic ability than the nonvirgins and their future educational goals also were higher than those who experienced sexual intercourse.

The results for black females and males are presented in Table 11. For black females there was a significant difference between virgins and nonvirgins in 1981 for the self-rank of English and educational goals. Those who were virgins in 1981 had a higher self-rank in English and higher educational goals

than those reporting to be nonvirgins in 1981. The difference in educational goals was also found between virgins and nonvirgins in 1987 for black females. There were no significant differences in educational variables for black males.

The results for white females and Males are presented in Table 12. For white females the self-rank of academic achievement in 1987 showed the largest difference between virgins and nonvirgins. Also, self-reported interest in school in 1981 and educational goals in 1981 and 1987 were significantly different for virgins and nonvirgins. The most significant results for white males were their interest in school and their self-rank of academic achievement in 1981 and 1987. Virgins manifested more interest in school and a higher self-rank of academic status than did nonvirgins.

Table 10

T-Tests Between Means for All Virgins and Nonvirgins on Educational Variables

1981 Education Variables	Nonvirgins Mean (n=118)	Virgins Mean (n=1004)	t
Parents' Rating of Child's Academic Achievement in 1981	3.18	3.63	4.34***
Child's Academic Achievement in 1981	3.16	3.46	3.38***
Child's English Performance in 1981	1.88	2.06	2.92**
Child's Interest in School in 1981	2.31	2.56	4.22***
Child's Educational Goals in 1981	3.25	3.59	3.40***
1987 Education Variables	Nonvirgins Mean (n=197)	Virgins Mean (n=777)	t
Child's Academic Performance in 1987	3.53	3.87	4.28***
Child's Educational Goals in 1987	3.83	3.99	2.05*
Child's Highest Grade Completed in 1987	12.42	12.43	.07

*p < .05 **p < .01 ***p < .001

Table 11

T-Tests Between Means for Virgins and Nonvirgins on Educational Variables, Black Females and Males

	Black Females			Black Males		
1981	Nonvirgins Mean (n=13)	Virgins Mean (n=104)	t	Nonvirgins Mean (n=86)	Virgins Mean (n=28)	t
Parents' Rating of Child's Academic Achievement in 1976	3.23	3.44	.82	2.86	3.29	1.95
Child's Academic Achievement in 1981	3.46	3.36	-.45	3.18	3.36	.82
Child's English Performance in 1981	1.76	2.13	2.06*	1.93	1.94	.09
Child's Interest in School in 1981	2.69	2.68	-.06	2.46	2.63	1.35
Child's Educational Goals in 1981	3.00	3.65	2.05*	3.43	3.53	.47
1987	Nonvirgins Mean (n=105)	Virgins Mean (n=14)	t	Nonvirgins Mean (n=99)	Virgins Mean (n=14)	t
Child's Academic Achievement in 1987	3.43	3.79	1.35	3.34	3.43	.32
Child's Educational Goals in 1987	3.73	4.31	2.13*	3.70	3.36	-1.09
Child's Highest Grade Completed in1987	12.37	12.14	-.50	11.90	11.15	-1.95

*$p < .05$

Table 12

T-Tests Between Means for Virgins and Nonvirgins on Educational Variables. White Females and Males

	White Females			White Males		
1981	Nonvirgins Mean (n=30)	Virgins Mean (n=408)	t	Nonvirgins Mean (n=47)	Virgins Mean (n=385)	t
Parents' Rating of Child's Academic Achievement in 1981	3.38	3.81	2.15*	3.23	3.56	1.95
Child's Academic Achievement in 1981	3.23	3.50	1.64	3.02	3.47	3.05**
Child's English Performance in 1981	2.00	2.18	1.55	1.81	1.95	1.43
Child's Interest in School in 1981	2.23	2.59	3.27**	2.17	2.48	3.21**
Child's Educational Goals in 1981	3.13	3.61	2.61**	3.28	3.53	.122
1987	Nonvirgins Mean (n=328)	Virgins Mean (n=83)	t	Nonvirgins Mean (n=342)	Virgins Mean (n=83)	t
Child's Academic Achievement in 1987	3.58	4.07	4.32***	3.45	3.76	2.41*
Child's Highest Grade Completed in 1987	12.46	12.76	1.65	12.37	12.39	.08
Child's Educational Goals in 1987	3.83	4.06	1.98*	3.83	3.91	.73

* $p < .05$ ** $p < .01$ *** $p < .001$

Analysis of Covariance of Educational Variables and Age of First Sexual Intercourse

To further examine the relationship to of the initiation of sexual intercourse on subsequent educational goals and achievement, an analysis of

covariance procedure was used. Only identical variables measured at two times could be used in the analyses. The sample was divided into those who made the transition to sexual activity between points of data collection and those who did not make the transition to sexual activity during this time. There were not enough cases in some cells to perform this analysis by race, with as few as 13 cases in a cell compared to 411 in another. Consequently the analysis was performed only by gender.

Table 13 shows the results of an ANCOVA for the change of rank in academic achievement between 1976 and 1981 and Table 14 shows the ANCOVA results for the change in academic achievement between 1981 and 1987. Table 15 shows the ANCOVA results for the change in educational goals between 1981 and 1987, when controlled for the previous measure of that variable. The change in the parents' rating of their child's academic achievement is not included in this table because the homogeneity of variance assumption was violated. It was found that the group of virgins and nonvirgins were found to have an unequal slope with the parents' rating of their child's academic achievement in 1981. A separate analysis that examined each parameter separately was performed and the results are shown in Table 16.

The results presented indicate that controlled for the self-rank of academic achievement in 1976, the transition to sexual activity between 1976 and 1981 was associated with a significant decrease in the self-rank of academic achievement in 1981 when compared to those who did not make the transition to sexual activity during this time. The adjusted mean of self-rank in academic performance for those who made the transition to sexual intercourse between 1976 and 1981 was 3.30 for females and 3.08 for males . The adjusted mean for those who did not report the transition to sexual activity

Table 13

ANCOVA of Child's Rating of Academic Achievement in 1981 with the Same Variable in the Previous Wave as a Covariate (N = 1122)

	Sum of Squares	Degrees of Freedom	Mean Squares	F	p
Covariate	53.85	1	53.85	68.8	.000
Gender	.71	1	.71	.91	.340
Virgins and Nonvirgins	4.29	1	4.29	5.48	.019
Virgins and Nonvirgins by Gender	.80	1	.80	1.02	.313
Adjusted Means	Virgin Females	Nonvirgin Females	Virgin Males	Nonvirgin Males	
	3.43	3.30	3.43	3.13	

between 1976 and 1981 was 3.475 for females and 3.447 for males. The beta for the model with the child's academic rank in 1976 as the covariate was .240 with a significance of .000. The difference between the two groups was significant and indicates that engaging in sexual activity between 1976 and 1981 was related to a decrease in the self-report of academic achievement in 1981. Also, it appears there was not an interaction between gender and being a virgin or nonvirgin in 1981 with the self-rank in academic status.

The rank of the child's academic status in 1987 also showed a significant difference for those who first experienced sexual intercourse between 1981 and 1987 and those who did not. Those who made the transition to sexual activity between 1981 and 1987 had an adjusted mean of their rank in 1987 of 3.57 for females and 3.44 for males when compared to 3.93 for females

Table 14

ANCOVA of Child's Rating of Academic Achievement in 1987 with the Same Variable in Previous Wave as a Covariate (N=1072)

	Sum of Squares	Degrees of Freedom	Mean Squares	F	p
Covariate	183.25	1	183.25	243.1	.000
Gender	3.40	1	3.40	4.34	.038
Virgins and Nonvirgins	18.01	1	18.01	23.01	.000
Virgins and Nonvirgins by Gender	.06	1	.06	.08	.783
Adjusted Means	Virgin Females	Nonvirgin Females	Virgin Males	Nonvirgin Males	
	3.93	3.57	3.77	3.45	

and 3.76 for males who did not report their transition to sexual activity between 1981 and 1987. The beta for the model with the child's rank of academic achievement in 1981 as a covariate was .424 with a significance of .000. This means that making the transition to sexual activity was associated with a decrease in the rank of academic achievement in 1987, when controlled for rank of academic achievement in 1981. Evidence was also found that females were more influenced by the transition to sexual activity than males. This means that females who experienced the transition to sexual intercourse between 1981 and 1987 reported significantly lower academic achievement in 1987 than males, when controlled for their rank in 1981. Finally, no interaction between gender, rank of academic achievement, and transition to sexual

Table 15

ANCOVA of Child's Educational Goals in 1981 with the Same Variable in Previous Wave as a Covariate. N=(1072)

	Sum of Squares	Degrees of Freedom	Mean Squares	F	p
Covariate	85.91	1	85.91	119.8	.000
Gender	.78	1	.78	1.09	.0297
Virgins and Nonvirgins	6.12	1	6.12	8.53	.004
Virgins and Nonvirgins by Gender	.54	1	.54	.76	.384
Adjusted Means	Virgin Females	Nonvirgin Females	Virgin Males	Nonvirgin Males	
	4.10	3.82	3.96	3.81	

intercourse was found.

As hypothesized, engaging in sexual activity also was associated with educational goals. The 1987 educational goals of those who made the transition to sexual activity between 1981 and 1987 were lower than those whodid not report a transition to sexual activity, when controlled for their educational goals measured in 1981. The adjusted mean scores for those who made the transition to sexual activity between 1981 and 1987 was 3.82 for females and 3.81 for males. For those who did not report the transition to sexual activity between 1981 and 1987, the mean score for females was 4.09 and 3.95 for males. The beta for this model with the child's educational goals in 1981 as a covariate was .346 with a significance of .000. Evidence was found that making the transition to sexual intercourse was related to a decrease in

educational goals in 1987, when controlled for educational goals in 1981. It appears that there were no gender or interaction effects with educational goals.

The analysis of the parents' rating of academic achievement was performed with separate parameters due to a violation of the homogeneity of slopes assumption. The F-score of the parents' rating of the child's academic status in 1976 within gender was 68.91 with a significance of .000. This means that the 1976 ranking of academic achievement is a good indicator of the 1981 rating. The F-score within the groups of virgins and nonvirgins was 5.03 with a significance of .025. This shows that the parents' rating of their child's academic achievement differed between those who remained virgins in 1981 and those who made the transition to sexual intercourse between 1976 and 1981. The F-score within the groups of virgins and nonvirgins by gender was .31 and not significant. This indicates that there was not an interaction between the parents' rating of their child's academic achievement, gender, and the groups of virgins and nonvirgins. The adjusted means of those who made the transition to sexual activity between 1976 and 1981 was 3.28 for females and 3.00 for males, and 3.74 for females and 3.50 for males who did not make the transition to sexual activity during this time.

The results of the regression analysis for separate parameters showed significant results and are presented in Table 16. These results indicate that making the transition to sexual activity between 1976 and 1981 was associated with a negative influence on the parents' rating of their child's academic achievement in 1981. Evidence was not found to support an interaction between the parents' rating, gender, and the groups of virgins and nonvirgins. These results mean that when controlled for the violation of homogeneity of

Table 16

Regression Results of Separate Parameters for Parents' Rating of Child's Academic Achievement in 1981

Parameter	Coefficient	t	Sig. of t
Parents' Rating of Academic Achievement in 1976 within Gender	.412	9.95	.000
Parents' Rating of Academic Achievement in 1976 within Virgins and Nonvirgins	.086	2.24	.025
Parents' Rating of Academic Achievement in 1976 within Virgins and Nonvirgins by Gender	.027	.558	.576

slopes, those who made the transition to sexual activity between 1976 and 1981 had parents who rated their child's academic achievement lower than adolescents who did not make the transition to sexual activity during this time, when controlled for the parents' rating in 1976.

Summary

Evidence was found to support the first hypothesis that adolescents with lower educational achievement and goals were more likely to initiate sexual intercourse at a younger age. The most support for this hypothesis was found for black females, with 23% of the variance in the age of first sexual intercourse explained by educational variables. The most important variables were the parents' educational expectations in 1976 and the teen's educational goals in 1981. White females followed with 10% of the variance in the age of first sexual intercourse explained by educational variables. Most important for white females was their parents' level of education and the adolescent's interest in

school in 1981. Educational variables did not explain the age of first sex for black males. For white males, educational variables explained 8% of the variance in the age of first sex, with the level of parents' education and the child's academic achievement in 1976 as an important variable.

Support was found for the second hypothesis, which is that sexual activity is related to lower subsequent academic achievement and goals. Differences in educational variables between virgins and nonvirgins were found in 1981 and 1987. Those who stated they were virgins at both times had higher scores on all educational variables, except their highest grade completed in 1987. The differences were greatest for white females, followed by white males. There
were no significant differences between virgin and nonvirgin black males.

The change in academic achievement and goals for those who experienced sexual activity between 1976 and 1981 was statistically significant. The child's rank of academic achievement in 1981 was lower for those who made the transition to sexual activity between 1976 and 1981, when controlled for their rank in 1976. Those who initiated sexual activity between 1981 and 1987 also showed a significant decrease in their educational goals and self-rank of academic achievement, when compared to those did not make the transition to sexual activity and when controlled for the 1981 score.

CHAPTER V

SUMMARY AND DISCUSSION

The purpose of this study was to examine the reciprocal relationship between the age of first sexual intercourse and academic goals and achievement. Specifically, it was hypothesized that lower educational goals and achievement are likely to influence an adolescent to initiate sexual intercourse at a younger age than those with higher educational goals and achievement. It was also hypothesized that initiating sexual activity decreases subsequent academic achievement and goals.

Previous research has found evidence that lower educational goals and achievement increase the likelihood of engaging in sexual intercourse at a younger age than an adolescent with higher educational goals and achievement (Billy et al. 1988; Jessor et al. 1983; Mott & Marsiglio, 1985). Evidence has also been found that engaging in sexual activity negatively affects subsequent academic goals and achievement (Billy et al. 1988; Jessor & Jessor, 1975). Possible reasons for these relationships are that the costs of engaging in sexual intercourse (pregnancy and sexually transmitted diseases) may deter adolescents from engaging in sexual intercourse. Pregnancy during adolescence truncates the number of years of education one attains (Waite & Moore, 1978). Weak attachment to parents may increase the influence of negative peer associations, which may increase the likelihood of sexual activity as well. It is also possible that adolescents who engage in sexual intercourse experience a change in mind set against community standards, one being high academic achievement and goals (Jessor & Jessor, 1975).

This project analyzed data from the National Survey of Children (NSC),

which is a national longitudinal sample of children aged 7 to 11 beginning in 1976, with additional data collection points in 1981 and 1987. First a regression analysis examined the influence of selected educational variables on the age of first sexual intercourse. The sample was then divided into two groups: those who had experienced voluntary sexual intercourse prior to the time of a data collection point and those who had not. T tests were performed to examine the difference in educational variables for virgins and nonvirgins in 1981 and 1987. To examine the change in educational goals and achievement that could have resulted due to the onset of sexual activity, an analysis of covariance was performed on educational variables that were measured at two points of data collection. The results of these analyses are now summarized.

Summary of Research Findings

The results of this research confirm that reciprocal relationships exist between adolescent sexual activity and educational achievement and goals. Lower educational achievement and goals, measured at an earlier point in time, were related to a lower age of first sexual intercourse. Also, engaging in sexual intercourse appears to be associated with a decrease in subsequent educational goals and achievement. The relationship between lower academic achievement and goals and the age of first sex varied by race and gender. Black females had the highest association with educational variables and black males the lowest association. Sexual activity had the strongest relationship with subsequent academic achievement, followed by educational goals.

The Association of Educational Variables and the Age of First Sexual Intercourse

The association of education and the age of first sexual intercourse was the strongest for black females. The parents' educational expectations and the adolescent's educational goals contributed significantly in explaining the age of first sexual intercourse. A possible explanation is that parents with higher educational expectations place more controls on their daughters (Hogan and Kitigawa, 1985). They may view sexual activity as a possible hindrance to their daughters' future educational attainments due to the threat of pregnancy and sexually transmitted diseases. Also, black females with higher educational goals may delay sexual activity because of the costs associated with early sexual activity. Those who are sexually active at younger ages are at a higher risk for pregnancy and sexually transmitted diseases. It has been established that pregnancy during adolescence was related to a decrease in the years of education one will eventually attain. Black females with higher academic goals may view sexual activity as a risky behavior with many costs and thus engage in sexual activity at a later age than those with lower academic goals.

For black males, no relationship was found between education and the age of first sexual intercourse. Many have theorized that black males perceive fewer educational and occupational opportunities in the United States. Therefore, education and career preparation are not viewed as highly important. It is likely that the perceived benefits of engaging in sexual activity are greater than the costs for groups that perceive few educational opportunities. It is therefore possible that an unwanted pregnancy or sexually transmitted disease is not viewed as a threat to educational pursuits. Thus, the costs of engaging in sexual activity in relation to academic pursuits may be

comparatively low.

Community norms that prohibit early sexual activity may be lower for black males than other groups. Social controls, specifically high educational expectations that could discourage early sexual activity, may not be as relevant for black males as with other groups. Negative peer associations may exert a stronger influence on black males than other groups. This could partially explain why education does not affect the age of first sexual intercourse for black males.

For white females, their parents' level of education and their self-reported interest in school were important predictors of the age of first sex. Previous research has shown that parents with higher levels of education were associated with an older age of first sexual activity for their daughters (Miller & Sneesby, 1988). It appears that white females with parents who have a higher level of education may place more controls on the behavior of their daughters due to higher educational expectations and in an effort to avoid pregnancy and STDs. Stronger attachment between parents and daughter likely occurred among this group and this increased the resiliency toward negative peer associations. Also, interest in school may be an important antecedent to future educational pursuits. Those who manifested a higher interest in school may be more likely to pursue further education and thus sexual activity could be more costly.

For white males, their parents' level of education and their self-rank in school were important factors in explaining the age of first sexual intercourse. Again, as Miller and Sneesby (1988) reported, parents with higher levels of education influenced the age of first sexual intercourse for their children in a positive direction. As with white females, parents may exert more controls on

their sons and have stronger attachment to future goals in an effort to prevent early sexual activity and subsequently pregnancy and STDs. Also, having a higher level of academic achievement also delays the age of first sex. White males who perceive themselves as successful in academic activities are less likely to engage in behavior that threatens their educational pursuits.

In summary, the truncated education that is likely to occur due to pregnancy during adolescence may act as a significant deterrent to early sexual activity for some groups more than others. This appears to have the strongest influence on black females who delay their age of first sexual intercourse when they set higher academic goals and had parents who set higher educational expectations for their daughters. The age of first sex for black males was not significantly related to educational variables. It is likely that peer and community factors have a stronger relationship to the age of first sex for black males. The level of parents' education and the level of interest in school are associated to a delay in the age of first sexual intercourse for white females. This is possibly due to the costs incurred with early sexual activity, which are an increased likelihood of pregnancy and STDs which reduce the number of years of education one will complete. White males manifested similar results. Their parents' level of education and their self-rank of academic achievement were found to be related to a delay in their age of first sexual intercourse, possibly due to the threat of pregnancy and STDs.

The Association of the Age of First Sexual Intercourse on Educational Variables

It appears that reporting to be a nonvirgin at the time of the interviews in 1981 and in 1987 was related to all educational variables, except educational attainment in 1987. The sample was divided into two groups: those who

reported their age of first sexual activity prior to the time of each interview and those who had not. The mean scores of all educational variables were then compared between the groups. It is possible that those with higher educational achievement and goals perceived the cost of engaging in sexual activity as high at a younger age. It is also possible that those who experienced sexual activity prior to the time of the interview experienced a significant change in their mind set against community standards. This change in mind set was likely to be associated with a decrease in their perceived importance of educational achievement and attainment. It remains unclear with this analysis if the difference in educational variables is due to the association of education with the age of first sexual activity prior to the interview or if the onset of sexual activity was related to lower subsequent achievement and goals prior to the interview. To clarify the direction of causality, further analyses were performed.

An analysis of covariance was performed to examine the association of the age of first sexual activity with subsequent educational achievement and goals. Identical variables that were measured at two times were used in this analysis to see if making the transition to sexual activity between the two times was related to a change in educational achievement and goals at time two. The results indicate that making the transition was negatively associated with educational achievement and goals. The adjusted mean score of a child's self-rank of academic achievement in 1981 for those who made the transition to sexual activity between 1976 and 1981 was significantly lower than those who did not make the transition to sexual activity. This change was also found for the parents' rating of their child's self-rank of academic achievement between 1976 and 1981, the child's self-rank of academic achievement between 1981 and 1987, and the child's educational goals between 1981 and 1987. The

change in educational goals and achievement was greatest for those who made the transition between 1981 and 1987.

Findings relevant to theoretical perspectives used in this study are now reviewed. Other research using this same data set found peer influences a significant factor in explaining sexual activity. Youth with peers who experienced sexual activity were more likely to have experienced sexual activity than those who did not have peers who were sexually active (Miller et al., 1994). Possible explanations may be that weak bonding between parent and child may have lead to increased peer associations during this period. The appraisal of rewards and costs of sexual activity may have been more influenced by peer input at this time than parental input.

It appears that a change in mind set occurs with the onset of sexual activity, which is related to a decrease in the perceived importance of educational achievement and goals. It is likely that the adolescent who becomes sexually active is also involved with other problem behaviors. It is probable that engaging in sexual activity garners more perceived benefits for the adolescent than the costs, such as pregnancy and STDs. Youth involved in a syndrome of problem behavior place lower importance on their parents' directions and expectations. This is likely to be associated with asignificantl decrease in the control and direction that a parent can place on their child, which in turn could increase the likelihood of engagement in future problem behaviors.

Those who had not engaged in sexual activity at an older age were less likely to engage in other deviant behaviors, associate with deviant peer groups, set higher educational goals, and report higher academic achievement than those who had engaged in sexual activity. It appears that early attachment

between parent and child is critical in establishing a strong commitment to future goals and community norms. This is likely to establish a resiliency to negative peer influences and create peer associations that encourage positive behaviors and goals. Whitbeck, Conger, and Kao (1993) found that adolescent girls who had received warmth and support from parents were less likely to fulfill these needs from peers or other assocaitions. Conversly, weak social bonds with parents diminished social constraints that discouraged early sexual activity and increased the influence of peers. A closer examination of this relationship could yield important findings of attachment issues. Parents who have higher levels of education appear to exert more influence on their children to set higher educational goals, achieve higher levels of academic performance, and avoid sexual activity and other problem behaviors.

Limitations of the Present Study

Due to the long interval between points of data collection, it is possible that a change in educational variables may have occurred several years after the initiation of sexual intercourse. Also, an adolescent may have engaged in sexual intercourse at an early time and did not alter his or her educational goals and achievement until several years later. To overcome this shortcoming, future research attempts should have more frequent points of data collection.

Another limitation was the restricted number of longitudinal variables. There were only four variables that could be examined longitudinally. Significant effects were found for these variables; however, more information is needed to precisely identify the effects of the onset of sexual activity on education. Also, many educational variables were excluded from the analysis due to large amounts of missing data. It would be beneficial to identify which

specific school subjects affect the age of first sexual intercourse and which school subjects are affected by the onset of sexual activity.

The number of black participants was low compared to the number of white participants who remained in the study for all three waves of data collection. The low number of blacks restricted the use of race as a control variable in the analysis of covariance. Future research attempts need to be mindful of the high attrition rates and sampling procedures need to be adjusted.

An additional limitation may be that the final wave of data collection occurred in 1987, which is 7 years earlier than this analysis. It is possible that the behaviors of adolescents may have changed in the last 7 years, which could diminish the accuracy of inference to a general population of adolescents today.

Future research projects that examine reciprocal relationships could utilize the two-stage least sqaures regression model. This model is desirable due to its simplicity, ease of computation, and desirable statistical properties. This method is commonly used in macroeconomic models. In a reciprocal model it is difficult to identify the causal direction of a relationship. A two-stage least squares model allows for identification of the coeffecients, which allows for an identification of direction of causality (Schroeder, Sjoquist, & Stephan, 1986).

Conclusions

Adolescents who had lower educational goals and who performed at a lower level than their classmates were more likely to engage in sexual intercourse at a younger age than those with higher educational goals and achievement. Also, those who were sexually active showed a decline in their educational goals and achievement at a later point in time.

The results point to the importance of programs that emphasize the costs of engaging in sexual intercourse at a young age in terms of pregnancy, sexually transmitted diseases, and future educational plans. Many programs exist that take this approach and have been successful (Hayes, 1987; Zabin & Hayward, 1993).

Parenting classes that emphasize attachment between parent and child and establishing strong commitments to future goals could be valuable tools in preventing the onset of problem behaviors and negative peer associations. Educators could also use this information to identify students who may be at risk. Those with lower educational achievement and expectations are at higher risk for engagement in sexual activity and other problem behaviors. Those with lower educational achievement and goals could be identified and intervention programs could be implemented to prevent unwanted pregnancies and involvement in other problem behaviors. Also, those who have been identified as sexually active are at risk for lower educational achievement and attainment. An intervention program could also be implemented to stress the importance of educational achievement and attainment.

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