CHAPTER I

INTRODUCTION

Statement of the Problem

Adolescent sexuality is a subject that receives much attention from the media, from parents, educators, teachers, and from adolescents themselves. While sex education and research are widely discussed, one group of adolescents is frequently omitted from conversations: the youngest adolescents. Many adolescents do not receive sex education in schools until they are past puberty, and some of the largest national databases on adolescent sexuality neglect to include those under 15 for some or all of their research questions (Singh & Darroch, 1999; CDC, 1995).

From the 1970s through the 1990s, adolescents' average age at first intercourse declined, and the percentage of young, sexually active adolescents increased (Elo, King, & Furstenburg, 1999; Paikoff, McCormick, & Sagrestano, 2000; Singh & Darroch, 1999; Brooks-Gunn & Paikoff, 1997; DHHS, 1995; AGI, 1994; Zabin, 1990). In 1979, about 5% of 15-year-old girls were sexually active; that number grew to 26% in 1988 (DHHS, 1995). Women's age at first intercourse has declined over the past two decades such that, in 1995, 82% of women between the ages of 20 and 24 reported having had sex by age 20, compared to only 69% of women between the ages of 40 and 44 (Elo, King, & Furstenburg, 1999).

Adolescents who become sexually active early—at age 14 or younger (Lammers, Ireland, Resnick, & Blum, 2000; Zabin, 1990; Leitenberg & Saltzman, 2000) face numerous health risks. They are more likely to engage in high-risk sexual behavior such as unprotected sex, having multiple and/or high-risk partners, raping a partner, and being intoxicated while having sex (Felton & Bartoces, 2002; Leitenberg & Saltzman, 2000; O'Donnell, O'Donnell, & Stueve, 2001; Greenberg, Magder, & Aral, 1992). Studies also show adolescents who engage in early sex are at much higher risk for becoming pregnant and for contracting sexually transmitted diseases (STDs) (DHHS, 1995; Greenberg et al, 1992; Rosenthal, Biro, Succop, Cohen, & Stanberry, 1994). In addition, early sexual intercourse is correlated with multiple negative behaviors in adolescents: alcohol and drug abuse, stealing, violence, being suspended or expelled from school, and poor performance in school (Ketterlinus, Lamb, Nitz, & Elster, 1992; Taylor-Seehafer & Rew, 2000; Billy, Landale, Grady, & Zimmerle, 1988; Beyers, Loeber, Wikstrom, & Stouthamer-Loeber, 2001). The earlier first intercourse

1

occurs, the greater the risk for some of these behaviors (Leitenberg & Saltzman, 2000; Zabin, 1990).

Most researchers agree an abstinence-only message is ineffective and inappropriate, considering the developmental nature of sexuality (Sexuality Information and Education Council of the United States, 1997; Casper, 1990; Chilman, 1990; Christopher & Roosa, 1990). Some suggest delaying first intercourse may be one way to protect adolescents from these risks (Yang, 1995). Yang postulates that, though it would be highly effective, delaying first intercourse is unrealistic. Some suggest promoting a safer sex model, which would encourage teens who choose to be sexually active to use protection against pregnancy and STDs (Christopher & Roosa, 1990; SIECUS, 1997). Some researchers, however, suggest that the content of the curriculum may not be the most influential element of school-based health programs (McNeely, Nonnemaker, & Blum, 2002). McNeely et al. suggest that current, school-based programs "do not address a crucial requirement for student health and well-being: the need to feel like one belongs to and is cared for at school" (p. 145). It is important, therefore, to explore the role of attachment to school in helping adolescents to delay first intercourse.

Rationale

Many researchers have used Problem Behavior Theory (PBT) as a framework for studying risky adolescent behavior (Donovan, Jessor, & Costa, 1988; Tildesley, Hops, Ary, & Andrews, 1995; Mitchell & Beals, 1997; Donovan, 1996; Jessor, 1982; Jessor & Jessor, 1975; Jessor, Costa, Jessor, & Donovan, 1983). This theory frequently refers to violence, aggression, delinquency, criminal behavior, substance abuse, and sexual activity as parts of a constellation of "problem behaviors" because they are all deemed undesirable by adult society (Donovan, Jessor, & Costa, 1999). PBT suggests that other problem behaviors are the most important factors to consider in predicting so-called problem behaviors. All behaviors considered problem behaviors, however, are not equivalent. While violent behavior is unacceptable regardless of the perpetrator's age or the severity of the offense, sexual behavior takes place along a developmental continuum and cannot be considered comparable to violence. Almost all humans eventually become sexually active during their lifetimes (Capaldi, Crosby, & Stoolmiller, 1996), and adolescence marks the time of most

rapid sexual development in humans (Paikoff et al., 2000). We must consider adolescent sexual activity separately from the cluster of problem behaviors, yet recognize that early first intercourse is one sexual behavior that puts adolescents at risk for physical, psychological, and social harm (Basen-Engquist, Edmundson, & Parcel, 1996). In addition, we must consider more than just problem behaviors when attempting to predict early first intercourse.

For these reasons, ecological theory (Bronfenbrenner, 1979) is a more appropriate framework for this study. It allows for the examination of factors belonging to different systems in the ecological model—self-system, micro-systems, meso-systems, and the exo-system—and for the comparison of those contexts to each other. This comparison of contexts—specifically self-system, parent micro-system, and school micro-system—is important in evaluating adolescents' risk of early first intercourse.

Parent-related factors are some of the most highly validated predictors of early sexual intercourse. Variables such as intact parent structure (Whitbeck, Yoder, Hoyt, & Conger, 1999) and few changes in parent structure (Capaldi et al., 1996), parental expectations that adolescents will not have early first intercourse and disapproval of early intercourse (Resnick et al., 1997), strong parent-child relationships (Subin, 1999), attachment and closeness to parents (Resnick et al., 1997; Tobey, 2001), and close parental monitoring during early adolescence (Paikoff, 1995; Whitbeck et al., 1999) have been shown to reduce the likelihood that adolescents will have early first intercourse.

Resnick et al. (1997) found parent connection influenced age at first intercourse more than any other parent variable measured, including parental monitoring, which was also significant, though at lower levels. Though Resnick et al. (1997) found high parent connectedness was predictive of later intercourse, several studies have found low attachment to parents to be more predictive of early first intercourse than high attachment to parents is of later first intercourse (Tobey, 2001; Whitbeck et al., 1999; Subin, 1999). This indicates a need to examine how adolescents with low attachment to parents may be protected from early first intercourse.

Although most studies show that parent-related variables are predictive in the expected direction, some studies show other factors can override the influence of parents (Christopher, Johnson, & Roosa, 1993). For example, Christopher et al. found Hispanic adolescents' sexual behavior was better predicted by adolescents' age, views on sex before

marriage, and perceptions of their friends' sexual behavior than by parent variables. Tobey (2001) found relationships with parents had no significant effect when adolescents also reported the occurrence of stressful life events.

Paikoff (1995) pointed out the need to examine early first intercourse using a developmental and context-comparison model, e.g. comparing the influences of parent and peers. Research in this area remains scarce, but some research on violent behavior indicates it may be fruitful to use such a model. Beyers et al. (2001), in studying the relative influence of different contexts on violent behavior, found socioeconomic status (SES) determined whether parent factors, such as communication and were influential or not. Biologically based risk factors were more significant for boys in high-SES neighborhoods, while parenting and early sexual intercourse were the weightiest risk factors for boys in low-SES neighborhoods. Rowe, Almeida, & Jacobson (1999) studied a large, nationally representative sample consisting of five groups of adolescents, ranging in relation to each other from monozygotic twins to unrelated siblings raised together, to determine the relevance of schools, genetics, and parent warmth on aggressive behavior. They found genetic factors were most significant in predicting aggression for adolescents who reported high levels of parent warmth and that environmental factors were more influential for those who reported lower levels of parent warmth (Rowe et al., 1999). This finding is significant because it implies strengths in some contexts may nullify weaknesses in other contexts, and adolescents' risk of engaging in problem behaviors can be reduced to genetic components. Further research is required to determine whether early first intercourse may be similarly affected.

Many children do not grow up with two parents in the home, and many children do not have close, positive relationships with their parents. Because parents are independent and cannot always be affected by programmatic efforts, we must look to additional sources to bolster children's chances of delaying sexual activity past early adolescence.

School variables have been correlated to later first intercourse in several studies (Whitbeck et al., 1999; Subin, 1999; Conley, 1999; Resnick et al., 1997). Resnick et al. found perceived school connectedness was the only school-related variable measured in this large, nationally representative, longitudinal study that protected against early first intercourse. Whitbeck et al. (1999) found positive attitudes toward school, participation in school-related activities and homework, and college aspirations were predictive of later first intercourse.

For the adolescents in one, small, qualitative study, low attachment to school was not synonymous with low achievement, low aspirations, or low value placed on school, suggesting attachment may be a unique construct (Mouton, Hawkins, McPherson, & Copley, 1996). Conley (1999), using nationally representative, longitudinal data, found that feeling part of school was one of two primary predictors of intercourse prior to age 16.

About 90% of the 20 million 7th through 12th graders in the U.S. receive school-based sex education intended to prevent high-risk adolescent sexual activity (Kaiser Parent Foundation, 2002). Though programs reach many children, the educational component alone may not be enough to delay first intercourse and increase the practice of safer sex. The above-mentioned studies suggest that raising levels of school attachment, particularly among adolescents with low levels of parent attachment, may enhance educational efforts already underway.

In sum, adolescent sexuality is an area of concern for many people. Parents worry about their children becoming sexually active and the potential for pregnancy and/or disease to occur; school systems debate how much, if any, education they should provide about sexual development; and researchers study what determines the rate of sexual development in adolescents, how they make their decisions, and what effects their decisions produce.

In this study, I view adolescent sexuality as a developmental process, meaning I postulate that while humans use adolescence as a time to explore and discover their sexuality, the pace of that exploration is important. My purpose is to address the timing of first sexual intercourse, rather than to condemn all adolescent sexual behavior. I will focus on a single behavior: early sexual intercourse, hereafter defined as sexual intercourse before age 15. Though sexual activity is a healthy part of human experience when the participants are physically, cognitively, and emotionally ready (SIECUS, 1997), I will demonstrate early intercourse as a behavior that has significant health risks when the participant is younger than 15. I review the literature indicating that low attachment to parents and to school are significant contributors to the occurrence of early sexual intercourse. Furthermore, I suggest that using an ecological model to examine and compare individual, parent, and school contexts will provide information about ways to create an environment in which children will be less likely to engage in early sexual intercourse.

I will discuss the relevance of attachment theory and present previous research regarding the idea that attachment may be one goal of early intercourse and that adolescents

with low attachment to parents may be most vulnerable to this pursuit. I will also discuss research suggesting school attachment may be an important source of attachment for adolescents, as well as a potential substitute for parental attachment, when that attachment is poor. I propose that adolescents who have early first intercourse may, in part, be attempting to satisfy an attachment need, and that meeting those attachment needs elsewhere, i.e. school, may help adolescents delay first intercourse.

Research Questions

1) Do the data confirm that school attachment is positively correlated with and predictive of later age at first intercourse, as Whitbeck et al. (2000), Subin (1999), Conley (1999), Resnick et al. (1997), and McNeely, Nonnemaker, & Blum (2002) have found?

2) Does the influence of school attachment on age at first intercourse vary as a function of parent attachment level?

3) What is the influence of school attachment and parent attachment relative to other factors in the self-system, parent micro-system, and school micro-system?

4) What differences across gender and ethnicity occur in overall levels of school and parent attachment?

5) What differences across gender and ethnicity occur in influence of school and parent attachment on age at first intercourse?

Research Hypotheses

1) The data will confirm that that school attachment is positively correlated with and predictive of later age at first intercourse, as Whitbeck et al. (2000), Subin (1999), Conley (1999), Resnick et al. (1997), and McNeely, Nonnemaker, & Blum (2002) have found.

2) The influence of school attachment on age at first intercourse will vary as a function of parent attachment level such that school attachment will be more predictive of age at first intercourse for adolescents who report lower levels of attachment to parents.

3) Variables in all three systems—self-system, parent micro-system, and school micro-system—will be significant predictors of the influence of school attachment on age at first intercourse. The models for each system will also be significant. The level of

influence will descend in this order: self-system, parent micro-system, school micro-system.

4) The examination of gender and ethnicity in both contexts is exploratory, so no specific hypotheses are postulated.

CHAPTER II

LITERATURE REVIEW

Sexual intercourse during early adolescence is accompanied by a multitude of risks. Delaying first intercourse until middle or later adolescence may protect adolescents from many of these risks. Parents and schools are two contexts that can have protective effects on adolescents' development and decisions, and attachment to those contexts is of particular value. In this chapter, I will discuss the developmental tasks of adolescence and introduce attachment theory and ecological theory as the theoretical frameworks used in this study. I will review the literature on adolescence and sexuality, with a focus on the age at first sexual intercourse and the problems that develop following early first intercourse. I will discuss the research on risk factors at various ecological levels for early first intercourse, as well as research on the definitions and relevance of family attachment and school attachment. In addition, I will examine how risk factors' influences change depending on context.

Adolescence

As children become adults, they pass through one of the most disruptive and change-laden transitions in the life cycle: adolescence. Adolescence ranges approximately from age 10 to age 22, and many researchers refer to three phases of this period: *early adolescence* (about age 10 to age 14), *middle adolescence* (about age 15 to age 17), and *late adolescence* (about age 18 to age 22) (Balk, 1995). During this time, adolescents experience biological, cognitive, social, and intrapsychic changes (Hill, 1980; Balk, 1995). Hill (1980) asserts the essential psychosocial tasks of adolescence are development in the following areas: "attachment, autonomy, intimacy, sexuality, achievement, and identity" (p. 5). In his review of the literature, Adams (1996) found recent research on these concepts confirms they remain salient as the core psychosocial issues of adolescence.

Herold and Marshall (1996) point out the need for use of a developmental perspective when investigating psychosocial variables related to adolescent sexual behavior. Because most of these tasks relate to attachment processes (autonomy, attachment, intimacy, and sexuality), attachment theory is a logical, relevant framework for this study.

Sexual Development In Adolescence

Sexual development is a major component of children's transition to adulthood. During puberty, adolescents experience tremendous changes in their hormones, reproductive organs, feelings, and thoughts about sexuality, faster than at any other time in

their lives (Miller & Dyk, 1993). Brooks-Gunn and Paikoff (1997) suggest adolescents' sexual health is dependent on the following four characteristics: having good feelings about their changing bodies; feeling comfortable with the concept of sexual arousal; development of sexual behavior (here, the authors refer specifically to behaviors such as masturbation as alternatives to intercourse), and practicing protected sex through the use of condoms and other contraceptives. Furman and Simon (1999) point out it is developmentally appropriate, and common, for adolescent romantic relationships to function more as a way to achieve status than as a way to meet attachment, relational, or sexual needs.

Theoretical Frameworks

Ecological Theory

Bronfenbrenner (1979) offers the following definition of the ecology of human development:

> The ecology of human development involves the scientific study of the progressive, mutual accommodation between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by relations between these settings, and by the larger contexts in which the settings are embedded. (p. 21)

In addition, Bronfenbrenner (1979) outlines the four components of the ecological model, one situated within the next. The *micro-system* refers to the interaction between an individual and a *setting*, which is "a place where people can readily engage in face-to-face interactions" (p. 22), such as a school, a home, or a workplace (Bronfenbrenner, 1979). The *mesosystem*, the next level of the ecological model, refers to the interaction between two settings, such as the interaction between parents and schools, the interaction between communities and families, or the interaction between churches and communities. The *exosystem* signifies the relationship of an individual and a setting once removed from an individual, e.g. the relationship between a child and her parent's social group, or between a husband and his wife's workplace. Finally, the *macrosystem* is described as the cultural thread that binds the institutions in lower systems. The effect of the macrosystem is to cause these institutions to resemble each other in broad terms, when compared to the same institutions in other macrosystems.

According to Westney (1993), "Regarding research, human ecology theory provides a rationale for the exploration of ecological variables related to the family. It suggests…taking

into account individual and family characteristics and attributes, as well as various activities and processes related to family functioning" (p. 449). This study uses a human ecology theoretical framework to consider the variety of variables outlined by Westney, as well as to evaluate the relative influence of two micro-systems (family-child and school-child) on age at first sexual intercourse.

Attachment Theory

Attachment theory is relevant because it offers a way of understanding humans' need for connection with other humans. The term attachment theory traditionally refers to Bowlby's (1969) work on infant attachment processes. He describes behaviors such as clinging to a caregiver, following her, smiling, babbling, sucking for reasons other than nourishment, and tracking the caregiver with eyes and ears as attachment behaviors. Because they encourage a caregiver's presence, these behaviors enhance the safety of an infant from the perils of his or her environment. Bowlby (1969) makes the distinction between *dependence* and attachment: while dependence on others for sustenance is inevitable for infants (and children), attachment is a separate process of bonding. The elements that define an attachment bond are: its enduring, person-specific, and emotionally significant qualities; the desire of the individual to be close to the attachment figure and to seek security and comfort in that person; and separation distress (Cassidy, 1999).

Attachment in Adolescence

During adolescence, as young people undergo a myriad of metamorphoses, adolescents are renegotiating their attachments to people and institutions. Allen and Land (1999) point out adolescents' behavior during these renegotiations seems to indicate self-sufficiency, but, in fact, to successfully proceed into the perilous yet exciting years ahead and toward eventual autonomy, adolescents need the secure base of attachment more than ever. In other words, feeling they can always retreat to a safe place is precisely what makes adolescents able to explore the selves they are developing, as well as the world around them (Allen & Land). They develop the ability to see ambiguity in their attachment relationships, which means they begin to decide which information to share with whom, and when. The primary relational goal is of reduction in dependence, but attachment to parents remains salient (Allen & Land).

Adolescent attachment behaviors do not strongly resemble those of infants (crying, tracking, clinging, etc.), and they may even seem to be anti-attachment, but they are not (Allen & Land, 1999). Partnership between parent and child becomes more flexible, and adolescents are able to consider their parents wishes in addition to their own, as well as to value the goals of maintaining trust and closeness in the relationship over smaller, more immediate goals such as getting their way. During this time, though, adolescents are less likely than infants or children to consistently ask for support from their parents when they are stressed (Allen & Land).

These authors also suggest the primary task of this period is the development and stimulation of adolescents' exploratory systems. Through this lens, the support of autonomy-seeking behavior is one of the key roles of attachment figures during this stage (Allen & Land, 1999).

Attachment and Adolescent Sexuality

For the purpose of this study, it is important to discuss the relevance of attachment theory to adolescent sexuality. Bowlby (1969) explains that, while attachment processes and sexual processes are separate, the two share common behaviors, such as kissing, touching, and other intimate behaviors. Furman and Simon (1999) compare and contrast attachment relationships and romantic relationships. Adolescent romantic relationships, they suggest, share proximity-seeking and safe-haven behaviors with attachment relationships, but they argue that adolescent romantic relationships are unlikely to include separation protest or to function as a secure base (Furman & Simon). Instead, parents maintain these functions through middle adolescence (Furman & Simon). Further research is needed to determine whether adolescents under age 15 who do not have secure attachments with their parents might attempt to meet their attachment needs through early sexual activity.

Multiple/Alternative Attachment Figures

The concept of the *principal attachment figure* is an essential component of Bowlby's attachment theory (1969). A principal attachment figure is the primary person to whom an infant becomes bonded. Some research suggests, however, that adolescents are able to relate to multiple adults as attachment figures, including some who are not related (such as teachers), and that attachment processes with these figures emulate the primary attachment processes (Howes, 1999). Howes describes the criteria she and several of her colleagues suggest identify an attachment figure for a child: providing physical and emotional care for

the child, being consistently present in the child's life, and having an emotional investment in the child.

Researchers dissent on the relative influence of multiple attachment figures. While some suggest the primary attachment influences all others, others suggest all attachments have equal influence (Howes, 1999). Still others propose that the influence of attachment relationships varies by context (Howes). Should an adolescent's principal attachment be weak or insecure, a protective factor for a variety of negative behaviors, could attachment to school partially compensate for that deficiency? Could attachment to schools meet some of the needs of adolescents with low attachment to their parents, who might otherwise seek to meet those needs through early sexual intercourse? Some research shows school attachment can have a tremendous positive effect on adolescents, similar to that of parent attachment (Resnick et al., 1997; McNeely et al., 2002; Brown, Leigh, & Barton, 2000). Further research is required to determine the influence of school attachment when parent attachment is low.

<p style="text-align:center">Sexual Risk-Taking</p>

Though development of healthy sexuality is one of the goals of adolescence, some teens engage in higher risk behaviors than others (Chilman, 1990; Chewning & Van Koningsveld, 1998). A sexually active 17-year-old in a committed, long-term relationship who uses condoms and another method of birth control, who gets regular gynecological care, and who can discuss her sexual activity with at least one adult she knows is at relatively low risk for health or psychological problems resulting from her sexual activity. Her level of risk is incomparable to that of a 12-year-old who has sex in exchange for drugs or money with men more than five years older than she, who uses alcohol and/or drugs, who neither practices safer sex nor receives any medical care, and who has no adult she can talk with about her sexual experiences. Early first intercourse, the focus of this study, is widely considered high-risk sexual behavior (Chewning & Van Koningsveld, 1998; Miller, Forehand, & Kotchick, 1999; Doljanac & Zimmerman, 1998; Small & Luster, 1994; Meschke, Bartholomae, & Zentall, 2000; Day, 1992; Miller & Moore, 1990). These researchers have found multiple health risks associated with early sexual intercourse, and theorists concur that sexual intercourse during early adolescence violates the developmental schedule for most children (Miller & Dyk, 1993; Paikoff et al., 2000).

Many other risks accompany the early foray into sexual activity: unprotected sex (Miller & Moore, 1990; Small & Luster, 1994; Chewning & Van Koningsveld, 1998), multiple partners (Taylor-Seehafer & Rew, 2000; Doljanac & Zimmerman, 1998; Miller, Forehand, & Kotchick, 1999; Rodgers, 1999; Meschke, Bartholomae, & Zentall, 2000; Luster, 1994), sex for drugs or money (Storkamp, 1997, Taylor-Seehafer & Rew, 2000), and sex with high-risk partners (Taylor-Seehafer & Rew, 2000) are all considered high-risk behaviors, but none is the focus of this study. Several, however, are correlated with early first intercourse (Leitenberg & Saltzman, 2000).

<u>Age At First Intercourse</u>

Approximately half (48%-53%) of high school students in the United States report ever having had intercourse (CDC, 1995; CDC, 1997). By 12th grade, between 60% and 66% of adolescents have experienced sexual intercourse (CDC, 1995; CDC, 1997). In a national, longitudinal survey, 85% of 19- and 20-year-olds reported ever having had sex (Rosenbaum & Kandel, 1990).

According to the Youth Risk Behavior Survey (YRBS) conducted by the Centers for Disease Control and Prevention (CDC), between 7% and 9% of high school students report having intercourse at age 12 or younger (1995, 1997). Researchers addressing the topic almost unilaterally determine intercourse prior to age 15 to be premature (Leitenberg & Saltzman, 2000; Zabin, 1990; Lammers et al., 2000), and some consider sex prior to age 16 early (Conley, 1999; Rosenthal, Smith, & de Visser, 1999; Brooks-Gunn & Paikoff, 1997). Zabin (1990) points out that it is "premature sexual activity, not coitus per se, that violates the normative schedule" (p. 298), and others concur, saying a characterization of all adolescent sex as problematic may be inaccurate and inappropriate (Billy et al., 1988).

Though many have sought to curb or eliminate adolescent sexual activity, the progressive increase of sexual activity over the course of adolescence, as well as the eventual almost-universality of sexual activity, tell us it is normative to begin sexual activity during adolescence (Chewning & Van Koningsveld, 1998; Chilman, 1990; Zabin, 1990). Timing of first intercourse, however, is not static across adolescents of all backgrounds, ethnicities, and experiences (CDC, 1997; Zabin, 1990). While, as Chewning & Van Koningsveld (1998) point out, exploration of sexuality is a part of healthy adolescence, teens differ in degrees of risk-taking. Chilman, too, points out that this exploration is essential to development through adolescence.

A large and complex group of factors have been shown to be risk factors for certain teens or groups of teens to become sexually active earlier than others (Porter, Oakly, Ronis, & Neal, 1996; Small & Luster, 1994). Male gender and African American ethnicity are two of these risk factors. Studies of age at first intercourse across ethnicity show African American adolescents, both male and female, are consistently more likely to have first intercourse between one and three years earlier than are White and Hispanic adolescents (Taylor-Seehafer & Rew, 2000; CDC, 1997; SIECUS, 1997) Conley (1999) found African American adolescents in a nationally representative survey were sexually active before age 16 three times more frequently than others. African American adolescents and male adolescents are also vulnerable to the negative consequences of early sexual intercourse (Miller, Forehand, & Kotchick; Ketterlinus et al., 1993; Beyers et al., 2001), so I will define sexual intercourse prior to age 15 as early for all adolescents.

Consequences Of Early First Intercourse

Many researchers have found negative associations with engaging in intercourse prior to age 14, such as engaging in other problem behaviors, especially substance use and violence (Ketterlinus et al., 1993; Crockett, Bingham, Chopak, & Vicary, 1996; Beyers et al., 2001; Leitenberg & Saltzman, 2000; Lammers et al., 2000; West, 2000; Bingham & Crockett, 1996;). Others concur that early adolescence is a time not conducive to sexual intercourse (Chilman, 1990; Miller & Moore, 1990). Still others refer to early intercourse as *high risk* or *risky* (Chewning & Van Koningsveld, 1998; Miller, Forehand, & Kotchick, 1999; Doljanac & Zimmerman, 1998; Small & Luster, 1994; Meschke, Bartholomae, & Zentall, 2000; Day, 1992; Miller & Moore, 1990) or as a *problem behavior* (Costa & Jessor, 1995).

Perhaps most importantly, significant health risks accompany early sexual intercourse, especially for girls. Greenberg et al. (1992) found, after controlling for ethnicity, level of education, and amount of time participants had been sexually active, women who became sexually active before age 15 (and after age 9) were far more likely to: have multiple partners within the last year, have sex with high-risk partners, and to have had an STD within the past five years. Rosenthal et al. (1994) found adolescent females' age at first intercourse was significantly associated with contracting more STDs, particularly for girls who had first intercourse prior to age 13. Both research groups raise two potential causes for this correlation: the increased vulnerability to STDs due to physical developmental stage, and

the increased risky sexual behavior that tends to accompany early first intercourse (Greenberg et al., 1992; Rosenthal et al., 1994).

Zabin (1990) suggests a potential reason early initiators are at such increased health risk compared to later initiators. Adolescent female participants in one study waited an average of 16.4 months after first intercourse to seek gynecological care of any kind (Zabin, 1981). Zabin reports this lag increases considerably the earlier the girl's age at first intercourse (1981). Zabin recounts multiple reasons adolescent girls offered for the delay, including cost, lack of sex and contraception education, and fear (1981).

A few studies have found no negative effects of early first intercourse. In her 1999 study, Rodgers found no differences between adolescents who became sexually active early and other adolescents, but she suggests this finding may be due to the very small number (26) of teens aged 14 or younger in her sample. Bingham & Crockett (1996) also found no negative outcomes in their study comparing teens who had earlier first intercourse to teens experiencing later first intercourse.

Factors Influencing Early First Intercourse

A vast and complex array of variables is involved in predicting early first intercourse (Porter, Oakley, Ronis, & Neal, 1996). I will review these factors using an ecological framework.

Self-System Factors

The decision to become sexually active ultimately rests with each individual. Though this study will focus on the school micro-system and the parent micro-system, self-system risk factors are part of the context of the path to first sexual intercourse (Brooks-Gunn & Paikoff, 1997; Rosenthal, Smith, & de Visser, 1999).

Gender. The clearest gender difference with regard to age at first intercourse is that boys tend to engage in intercourse earlier than girls (CDC, 1997; AGI, 1999). In addition, some of the other influential factors here differed across gender. Somers and Gizzi (2001) found no gender effects in school-related variables associated with age at first intercourse, though boys reported more engagement in risky behaviors. Whitbeck et al. (1999) found girls who spent time in school activities had more delayed first intercourse than boys did.

15

Depression also varied by gender in their study in that girls' depression was significantly associated with early sexual intercourse, while boys' was not (Whitbeck et al.).

Substance abuse. In a multivariate analysis of data from questionnaires completed by 349 urban, 7th-9th graders, Subin (1999) found that substance abuse was a risk factor for early first intercourse. Others have concurred: Rosenbaum and Kandel (1990) found that when they controlled for major risk factors such as demographic, social, and familial characteristics, reports of using alcohol and drugs (including tobacco) were significant predictors of early first intercourse, regardless of gender. They added that likelihood of adolescents engaging in early intercourse rises significantly with intensity and age of onset of substance use (Rosenbaum & Kandel, 1990). Conley (1999) found adolescents in a nationally representative sample were more likely to have engaged in early intercourse if they had used alcohol outside the family or used marijuana at an early age.

In their follow-up comparison of 105 adolescents with substance abuse histories and 77 adolescents with no such history, Tapert, Aarons, Sedlar, & Brown (2001) found earlier first intercourse was more common to the substance abusing teens in treatment than to the nonabusing teens. Equally importantly, they found that substance abusing teens were also more prone to using condoms more erratically, contracting a sexually transmitted disease (STD), including human immunodeficiency virus (HIV), and having intercourse with more partners (Tapert et al., 2001).

One investigation of early intercourse risk factors for adolescent males found substance abuse not only predicted early first intercourse for boys, but also that boys' use of substances increased during the time in which they had first intercourse (Capaldi, Crosby, & Stoolmiller, 1996).

Small and Kerns (1993) found binge drinking within the past month to be a risk factor for adolescent girls to be victims of unwanted sex, and girls in one study who engaged in intercourse earliest had higher self-reported levels of substance use than girls who had first intercourse later (Crockett et al., 1996). Rosenthal et al. (1999) also found adolescents in a cross-sectional study who had early first intercourse used cigarettes, alcohol, and drugs more than those who initiated intercourse later.

Psychosocial. Evidence on the effect of psychosocial variables on adolescents' age at first intercourse is varied. One large, statewide cross-sectional study of adolescent sexuality showed that, for the whole sample, depression did not rank as a correlate of early sexual

intercourse, but history of attempting suicide did (Lammers et al., 2000). For girls aged 13-14, however, depression appeared to affect age at first intercourse in the expected direction; girls in this age range who were less depressed were also less likely to have had intercourse (Lammers et al., 2000).

Self-esteem has been a popular topic of research, but results have been conflicting. Some studies show high self-esteem is predictive of later intercourse (Whitbeck et al., 1999), while others find high self-esteem and high levels of body pride are correlated with earlier first intercourse (Lammers et al., 2000). Crockett et al. (1996) found no support for their hypothesis that psychosocial variables, including self-esteem, self-image, and peer relations, would be predictive of early first intercourse. Miller and Dyk (1993) reviewed research showing self-esteem's effect on age at first intercourse varied according to beliefs about premarital sex; high self-esteem and positive beliefs about premarital sex predicted sexual activity, whereas high self-esteem and negative beliefs about premarital sex predicted abstinence. It seems the effect of self-esteem is mediated by other variables, so there may not be an absolute effect of self-esteem.

Delinquency. Many studies examine the link between delinquency and early first intercourse. Problem Behavior Theory centers on the concept that delinquent behaviors such as alcohol and drug abuse, violence, vandalism, other law-breaking, and early sexual activity form a constellation of related, troublesome adolescent behaviors (Donovan & Jessor, 1985; Donovan, 1996; ; Crockett et al, 1996; Jessor, 1982). In a small, longitudinal study, Whitbeck et al. (1999) found that having engaged in delinquent behaviors such as theft, assault, and vandalism was predictive of earlier first intercourse. While connections between delinquency and early first intercourse are well established, the circular nature of problem behavior theory encourages looking outside this behavior constellation for causation.

<center>Micro-system Factors</center>

Parent Micro-system

Most research on the impact of the family on adolescent sexuality shows family factors are very significant in predicting timing of first intercourse. Positive family ties and solid structure are consistently and positively correlated with later first intercourse (Lammers et al., 2000; Resnick et al., 1997; Taylor-Seehafer & Rew, 2000; Dornbusch, Erickson, Laird, & Wong, 2001).

<center>17</center>

However, many researchers found family factors to be more important in some contexts than in others. Whitbeck, Yoder, Hoyt, & Conger (2000) found bad relationships between parents and children were stronger predictors of the age at which adolescents had first intercourse than good relationships were. Family influence also seems to vary as a function of socioeconomic and cultural influence; for example, strong relationships between parents and children were predictive of later first intercourse for African American girls in low-income, inner city neighborhood (Moore, 1998). Girls who reported having expressive families that provided supervision for them began having sex later in adolescence (Rosenthal et al., 2001).

Parent attachment. Parent attachment has been described in numerous ways by researchers and family advocates. Using cross-sectional analysis of 12,188 adolescents in a nationally representative sample, Resnick et al. (1997) found parent-family connectedness, which they defined as "feelings of warmth, love, and caring from parents" (p. 830) to be a significant correlate of later sexual intercourse. Lammers et al. (2000) studied surveys of 26,023 adolescents in a Midwestern state to determine the impact adolescents' perceptions of parents' caring and expectations on their age at first intercourse. Results showed feeling that parents care and perceiving high parental expectations were both positively correlated to later first intercourse (Lammers et al.). In a small, cross-sectional study, Donnelly et al. (1999) found girls who perceived their families as helpful and supportive were less likely to have had intercourse.

Walsh (1996) examined the effect of parental attachment on sexual activity and drug use using a cross-sectional sample of college undergraduates. Those who reported weak attachment to parents also reported more unrestrained sexual activity and more drug use. In a cross-sectional survey study of 76 adolescents and their parents, Tobey (2001) found strong attachment to parents was associated with decreased sexual risk-taking, such as the use of alcohol or drugs prior to sexual activity and becoming sexually active soon after the initiation of a relationship. Using Add Health data (a nationally representative, large, longitudinal data set), Conley (1999) found adolescents who felt generally unloved and unwanted were at higher risk for early first intercourse.

Though there is strong evidence that high parent attachment is one protective factor for age at first intercourse, some evidence shows low or insecure parent attachment is more damaging than high attachment is protective. In addition, girls with lower levels of

attachment to their mothers were more likely to become sexual quickly in relationships (Tobey, 2001). Whitbeck et al. (1999) found mother-child relationship influence only existed when that relationship was poor; in these cases, adolescents were more likely to have early first intercourse. In addition, mother rejection was correlated in this study to earlier first intercourse. Good mother-child relationships seemed to have no influence on the timing of first intercourse, but it is possible that the inclusion of fathers in this study might have changed the influence of parent relationships. Subin (1999) also found adolescents who had poor relationships with their parents were at higher risk for early first intercourse.

In addition to being a more powerful predictor when it is negative, it seems the effect of parent attachment can be diluted or even nullified by certain other factors, contexts, or events. For example, in a small study of adolescents and their caregivers, Tobey (2001) found attachment to parents did not moderate adolescents' age at first intercourse for adolescents who reported experiencing stressful life events. Christopher, John, and Roosa (1993) found parent-child communication and parental warmth, generally considered part of attachment, were not at all significant in predicting levels of sexual activity for 489 low-SES, Hispanic adolescents. Because of the variability of the effect of parent attachment, it is important to investigate the comparative influence of alternative attachments in order to boost the overall protective effect of attachment.

Parent separation. Magnusson (2001), in her review of the research, cited single-parent family structure as a widely validated predictor of earlier first intercourse among adolescents. One small, longitudinal study showed that, regardless of adolescents' gender, living in a non-two-parent household was predictive of early first intercourse (Crockett et al., 1996).

Lammers et al. (2000) found in a cross-sectional study that adolescents under age 17 who lived with both parents were less likely to have early first intercourse than those who lived with a single parent. Whitbeck et al. (1999) also found single-parent family structure was significantly associated with earlier intercourse in their study using event history analysis. In contrast to these studies, however, Capaldi et al. (1996) found the number of changes in parental figures (how many times a parent was separated, divorced, or remarried) was the significant risk factor, not simply family structure. Adolescents in this study who had early first intercourse (eighth grade or earlier) reported experiencing two transitions on average,

19

and those who had not had intercourse at all reported experiencing less than one on average (Capaldi et al.).

While family structure and transitions seem to have an effect on adolescents' age at first intercourse, a gap in the literature exists regarding the relative influence of family structure and family attachment. For example, Resnick et al. (1997) controlled for family structure, but found parent connectedness was significant. Though Lammers et al. (2000) found negative associations between early intercourse and both family structure and family attachment, these authors do not isolate the variables to determine the influence of each. Several of these authors speculate one cause of the correlation between parent separation and early first intercourse may be a reduction in parental monitoring in non-intact families (Crockett et al, 1996; Lammers et al.).

Parental monitoring. Numerous researchers have investigated the effect of parental monitoring, or how much parents know about their children's activities, friends, and whereabouts (Whitbeck et al., 1999). In their large, longitudinal study, Resnick et al. (1997) found parental monitoring was consistently less significant than parent connectedness in predicting age at first intercourse, though monitoring was slightly significant. Parental monitoring was strongly correlated with later first intercourse in Rodgers' (1999) survey study, but it was a small, cross-sectional study of 350 mostly White adolescents. Though they did not investigate age at first intercourse, Small and Luster (1994) found a strong link between parental monitoring and sexual activity, such that teens who reported their parents monitored them vigilantly were less likely to have had intercourse at all. Their study, too, however, was cross-sectional and representative only of a single Southwestern city. Paikoff (1995) found that fourth and fifth graders in a small, qualitative study had fewer sexual opportunities if they experienced higher levels of parental monitoring. Small and Kerns (1993) found low monitoring is also a risk factor for adolescent girls to experience unwanted sex (which, in turn, is a risk factor for earlier intercourse).

Whitbeck et al. (1999) found the effects of parental monitoring vary with age in their small, longitudinal study. When they controlled for family structure, pubertal development, gender, and grade level, they found reports of close mother monitoring decreased the risk of early intercourse for adolescents in eighth and ninth grades, but increased the risk of early intercourse for those in 10th grade.

Clearly, parental monitoring is an influence on adolescents' age at first intercourse, but the size and nature of that influence remains unresolved. Regardless of the variation in studies on monitoring, however, parent attachment, particularly low attachment, seems more reliably predictive of age at first intercourse.

Parent attitudes. Though adolescents can outwardly seem to have no use for their parents' opinions, parental views on sex make a difference on adolescents' transition to sexual activity. One nationally representative, large, longitudinal study found adolescents who said their parents disapproved of early sex were less likely to engage in this behavior (Resnick et al., 1997). Adolescents' reports that their mother had a history of teen pregnancy (which may convey permissiveness) was also shown to be a predictor of earlier first intercourse in a smaller, longitudinal study of White, rural adolescents (Crockett et al., 1996). Small and Luster (1994) found adolescents who believed their parents thought it was wrong for teens their age to have sex were less likely to have had sex. These authors add that boys were more likely than girls to report their parents had permissive attitudes about sex (Small & Luster). Lammers et al. (2000), however, found high parental expectations were a significant predictor of later first intercourse only for adolescent males in their large, cross-sectional study in conducted in Minnesota.

Parent communication. Zabin (1990) describes the evidence for a link between parent-child communication and adolescent sexual behavior as tenuous and adds that few good studies have been done on the topic. She points out the possibility that communication could have more to do with like-minded thinking than with actual conversations. Zabin also stresses teens who are in the most need of communication with parents are the least likely to seek it or receive it.

Rodgers (1999) found boys whose parents talked with them about sexuality were more likely to perceive their parents as supportive. Girls who felt controlled by their parents, Rodgers found, were more likely to take sexual risks than other girls. Rosenthal et al. (2001) investigated adolescent girls' perceptions of family expressiveness as it relates to age at first intercourse. In their longitudinal study, family expressiveness was predictive of later first intercourse.

School Micro-system

School attachment definition. In 1990, Entwisle reviewed the literature on schools and adolescents and called for more research on classroom dynamics and the ecology of

schools, as a departure from focus on teacher qualifications, academic achievement of students, school size, and the like. Since then, the concept of *school attachment* has emerged to describe students' sense that they are part of a community at school; that it is a safe place they like going to, where people care about them and where their thoughts, feelings, and needs matter (McNeely et al., 2002; Dornbusch et al., 2001; Brown, Leigh, & Barton, 2000; Dewitt, 1995; Mouton, Hawkins, McPherson, & Copley, 1996; Small & Luster, 1994; Gottfredson, 1985).

A few recent studies have examined the components of school attachment and have tried to determine what students mean when they indicate they are attached to school. One study using Add Health data investigated which factors predict higher adolescent attachment to school (McNeely et al., 2002). These authors found students who participate in extracurricular activities, who get higher grades, and who do not skip school reported feeling more attached to school (McNeely et al.). These authors also discovered school-level factors that contributed to adolescent attachment to school. Classroom management climate, school size, severity of discipline policies, and number of students who participate in extracurricular activities accounted for a significant portion of the variance in school attachment (McNeely et al.). Adolescents who participated in Dewitt's (1996) small, qualitative study revealed academic aspects, relationships with friends and school personnel, and participation in extracurricular activities were the main components of attachment to school.

One study posited school connection elements as *power, belief, commitment,* and *belonging,* concepts borrowed from social control theory (Brown et al., 2000). Using a factor analysis, these authors verified the validity of three elements. Belief, comprised of factors indicating the level of belief in the school's validity and feeling able to influence the school, accounted for the most variance in this analysis (Brown et al.). Belonging, which measured attachment to those at school, also contributed. Commitment, or believing school is relevant to one's goals, was also a salient part of school connectedness.

Some studies have found school attachment is related to school achievement and motivation. Goodenow and Grady (1993) used an 18-item scale to measure *school belonging* in terms of students' feelings of being liked, included, accepted, encouraged, respected, and valued at school. Among adolescents in their small, urban sample, those with high levels of belonging were also more motivated and involved in academics. At the same time, these authors and others point out that the connection between attachment and achievement is

not absolute (Goodenow & Grady, 1993; Mouton et al., 1996). Urban, mostly working-class, Hispanic and African American adolescents in the Goodenow and Grady study were less attached but just as high-achieving as their middle-class, suburban, mostly White counterparts in another study by the same authors (Goodenow & Grady). Furthermore, in a small, qualitative study, adolescents who described having low attachment to their school also described having high educational aspirations, including high school graduation and continuation to further education (Mouton et al., 1996). While there is some connection between achievement/motivation and attachment, significant evidence indicates the variables may act independently. It is useful, therefore, to study the effect of school attachment separately from achievement and motivation.

Influence of school attachment. One large study using Add Health data found school connectedness to be the only school-related factor that predicted all eight risky behaviors examined (Resnick et al., 1997). Somers and Gizzi (2001) investigated school attachment, school involvement, and feelings about future plans regarding education, in their cross-sectional analysis of 551 adolescents from a single high school. These researchers found school attachment was the only predictor among the three of age at first intercourse, as well as of birth control use. Number of partners was affected by both school attachment and school involvement (Somers & Gizzi, 2001).

Small and Luster (1994) investigated the concept of school attachment, calling it "attitudes toward school" (p. 185), and found school attachment was one factor (of many) negatively correlated with sexual activity (age at first intercourse was not investigated). Whitbeck et al. (1999) separated school attachment (defined in this study as liking school, not being bored, getting along with teachers, etc.) and extracurricular participation and found both had a delaying effect on adolescents' first intercourse. The effect of extracurricular participation and time spent doing homework was stronger, however, and was more significant for girls than for boys (Whitbeck et al.). In a large, cross-sectional study based on Add Health data, Conley (1999) found *feeling part of school* was one of two primary predictors of later first intercourse. Williams et al. (1999) found levels of school attachment were nearly equal between White and African American adolescents, with African Americans very slightly more attached to school.

McNeely et al. (2002) suggest schools can successfully increase students' feelings of attachment to the school. As adolescents get older, connection to school decreases

(McNeely et al.). Children's school attachment must therefore be strong prior to early adolescence in order to affect the timing first intercourse.

School performance. Several researchers have determined lower school performance is linked to higher rates of early sexual intercourse. An 11-year study using nationally representative data found adolescents' lower academic achievement and lower educational goals predict greater likelihood of early first intercourse (Schvaneveldt, Miller, Berry, & Lee, 2001). Small and Luster (1994) also found adolescents with poor school performance were more likely to be sexually active than those with higher academic achievement. Adolescents in one large, statewide survey who reported lower performance in school were nearly twice as likely to have early first intercourse as those with higher school performance (Lammers et al., 2000). Girls in a small, longitudinal, rural sample who said they had sex earliest reported lower levels of involvement in academics than other girls (Crockett et al., 1996).

Future aspirations. Adolescents' hopes and expectations of future achievement seem to have a positive effect on delaying first intercourse. Whitbeck and his colleagues (1999) found aspirations of going to college were generally predictive of later first intercourse for adolescents in their small, longitudinal survey. Neither adolescents' grade level nor gender affected this finding (Whitbeck et al.). Of the variables considered in another, cross-sectional study, expectation of graduating from high school was the second-strongest predictor of later first intercourse for adolescents (Donnell, Goldfarb, Duncan, Young, & Eadie, 1999).

<div align="center">Comparing Contexts</div>

As this review has illustrated, many investigations of risk factors for early first intercourse include measures of the effects of one or more micro-systems on the adolescent. Studies comparing the influences of those contexts are less common. A larger body of literature on delinquency offers some insight to the value of comparing the influences of different contexts on a single dependent variable.

Liska and Reed (1985) used a large, longitudinal national probability sample to look for recursive effects between parent attachment, adolescent delinquency, and school attachment, assuming that these three variables might act reciprocally on each other. Instead, they found parent attachment affected delinquency; delinquency affected school attachment; and school attachment affected parent attachment. No other effects were found; i.e. parent attachment did not directly affect school attachment.

Williams et al. (1999) performed a longitudinal investigation to determine how risk factors for delinquency and substance abuse varied between 562 White and African American adolescents in a single city. Using multiple group analysis, the authors found similar models of prediction held true for both races, regarding both substance abuse and delinquency. Those models indicated that family relationships, including an attachment component, acted on all other constructs, including school attachment, as well as the dependent variables. None of the other variables in the study, however, acted on family relationships (Williams et al.). This literature suggests the immutability of family attachment and provides support for the enhancement of attachment to alternative figures, such as schools, when family attachment is low.

Though no widely-published studies have directly examined the interaction of environmental and biological risk factors on early sexual intercourse, some researchers have examined this phenomenon as it relates to adolescent aggression. In a longitudinal study, Beyers et al. (2001) examined a number of risk factors in adolescents living in high-SES and low-SES neighborhoods and found environmental risk factors were more influential for those living in low-SES neighborhoods, whereas biologically based risk factors were more salient for those in high-SES neighborhoods. Specifically, they suggest, "disrupted family processes and context-dependent risks may promote aggressive behavior even among individuals without a genetic predisposition" (Beyers et al., p. 379). Likewise, Rowe et al. (1999) found biologically based risk factors were more influential for those adolescents who reported higher family warmth, and environmental factors were more influential for adolescents who reported lower family warmth. Family warmth also acted as a moderator on genetic and environmental influences with regards to aggression (Rowe et al.). These studies suggest environmental factors, such as SES, family context, and school context are extremely important; when these are positive influences, other factors do not seem to contribute. When they are negative, however, they have the power to influence adolescents to behave in ways they might not in other contexts. These findings point to the importance of investigating the influence of multiple contexts and to examine the ability of one context's positive influence to compensate for another context's negative influence.

<div align="center">Summary</div>

Because adolescents are affected by so many factors at so many levels of society—individual, family, community, school, culture, country, and more—we need to examine the

interactions of the effects these different contexts have on adolescents. Many individual factors are out of our control. Gender, ethnicity, and rates of physical development cannot be changed. Though we can take steps to reduce depression, substance abuse, and delinquency, we cannot undo these things once they have happened. We can, however, focus on factors that might buffer the risk these individual factors present. We can, for example, look for family factors and school factors that may prevent the individual risks from occurring and may reduce the damage should they occur.

We know adolescents are affected by school attachment, and we know they are affected by family attachment. We even know that both of these factors have specific and direct associations with the age at which adolescents first have sexual intercourse. What is left unexamined, however, is how the family and school effects interact with one another and with individual factors to produce a net effect on age at first intercourse. I aim to fill this gap by determining the effect family attachment level has on the relationship between school attachment and first intercourse. This study will consider the age at first intercourse through the developmental lens of attachment theory.

CHAPTER III

METHODS

Study Participants And Procedures

Study participants were 7th-12th grade public school students from five contiguous, rural, ethnically diverse Virginia counties surveyed in the fall of 2001 and spring of 2002. The Community Services Board for these counties had received a grant to study adolescent risk and resiliency, and they contacted Virginia Cooperative Extension at Virginia Tech to provide technical assistance in the design of a self-report questionnaire and data analysis. This process was called the "Virginia Adolescent Resiliency Assessment" (VARA). Whole school census procedures were used; thus all students in the five counties were invited to participate. The overall response rate for participants in the five counties was 85%, so although this sample is not representative of all rural, Virginia counties, it represents many of the adolescents in this particular area. It is important to note that, because of the self-report nature of the survey, the results reflect adolescents' perceptions only. Ninety-three percent (93%) of respondents said they were honest on "all" or "all but a few" questions in the questionnaire, which suggests that, for the most part, the adolescents' reports were truthful.

In accordance with school board policy, parents were notified of the study and its purpose through a passive consent form that was sent home with all enrolled students. Parents who did not want their children to participate were asked to contact the school to withdraw their consent. Students also could decide to withdraw at the time of administration. On the day the questionnaire was administered, one classroom period was devoted to the completion of the paper and pencil questionnaire. A teacher proctored each classroom by reading the instructions to the students, answering students' questions if necessary, and collecting the questionnaires in an envelope. The VARA questionnaires were anonymously completed and collected, and the students, who were allowed to withdraw from the study at any point, voluntarily completed the questionnaires. Those students who withdrew from the study were allowed to go to the library or to sit quietly and read.

The response rate for the aggregate sample was 85%. Out of 2,738 students present on the day of administration, 2,329 completed usable questionnaires. The remaining students either did not participate or completed unusable questionnaires (those with more than 10% of questions left blank, answered out of range, or double-answered). The 2,329 complete, usable questionnaires were included in the analyses.

Demographics of the Sample

       The whole sample consisted of 2,329 participants, 1,196 (52%) of whom were female, and 1,098 of whom (48%) were male. The demographics of this sample are displayed in Table 1. The sample is not evenly distributed by grade; 13% were seventh graders, 12% eighth graders, 22% ninth graders, 21% tenth graders, 16% eleventh graders, and 15% twelfth graders. The sample participants reported their ethnicity as 54% "White or Caucasian", 39% "Black or African American", 1% "Native American", 2% "Mixed race or biracial", 2% "Other", .6% "Asian", and .8% "Hispanic or Latino".

       About half of the sample (49%) reported living with both a mother and a father (biological or adoptive). Twenty-one percent (21%) reported living in a blended family, and 16% said they live with their mother only. An additional 6% reported living with relatives. The other 8% of students reported living with a father only, living half with mother and half with father, living with a parent and a non-relative, living in a foster home, and/or living alone or with friends. Just over half (55%) also reported their parents were married (as opposed to separated, divorced, or never married). According to the respondents, 66% of mothers and 72% of fathers work full-time. Respondents reported the vast majority of their parents (96% of mothers and 94% of fathers) had at least a high school education. About 49% of fathers and 43% of mothers did not continue education past high school, according to the adolescents in this survey.

Table 1
Demographics for whole sample (n=2329)

	n	%		n	%
Gender			**Mother's work**		
Female	1196	51.4	Full-time	1498	65.9
Male	1098	47.1	Part-time	337	14.8
Age			Homemaker	210	9.2
12 or younger	134	5.8	Retired/disabled	90	4.0
13	307	13.4	Unemployed	73	3.2
14	396	17.2	Don't live with mother	48	2.1
15	510	22.2	Full-time student	16	0.7
16	446	19.4	**Father's work**		
17	378	16.4	Full-time	1637	70.3
18 or older	127	5.5	Part-time	123	5.4
Grade			Homemaker	25	1.1
7	310	13.3	Retired/disabled	112	4.9
8	274	11.8	Unemployed	51	2.3
9	511	21.9	Don't live with father	309	13.6
10	480	20.6	Full-time student	16	0.7
11	368	15.8	**Mother's education**		
12	348	14.9	Elementary or jr. high	91	4.0
Ethnicity			High school	886	38.8
Asian	14	0.6	Some college/tech	370	16.2
African American	895	38.4	2 year degree	207	9.1
Hispanic	18	0.8	4 year degree	311	13.6
Native American	28	1.2	Beyond 4 year degree	81	3.6
White	1237	53.1	Graduate degree	92	4.0
Mixed race/biracial	46	2.0	Don't know	243	10.7
Other	49	2.1	**Father's education**		
Live with			Elementary or jr. high	144	6.3
Mother & father*	1118	48.9	High school	980	43.0
Mother & stepfather	408	17.8	Some college/tech	294	12.9
Mother only	372	16.3	2 year degree	106	4.7
Relatives	136	5.9	4 year degree	242	10.6
Half mom, half dad	77	3.4	Beyond 4 year degree	45	2.0
Father & stepmother	71	3.1	Graduate degree	65	2.9
Father only	55	2.4	Don't know	401	17.6
Parent and nonrelative	30	1.3			
Alone or w/ friends	16	0.7			
Group/foster home	5	0.2			

* Biological or adoptive

Design of the Study

Data Collection Instruments

The measures for this study were derived from a larger questionnaire entitled the Virginia Adolescent Resiliency Assessment (VARA). The VARA is a 174-item questionnaire, based on a community-based action research process developed by Stephen Small from the University of Wisconsin-Madison/Extension (Small & Rodgers, 1995). This survey process was adapted to account for teen perceptions of their community and school, teen aspirations, concerns and attitudes about various aspects of their lives, teen mental and physical health, and the frequency that the teens report engaging in both dangerous and desirable behaviors. This research process has been used widely in at least seven U.S. states. Some of the measures from the VARA questionnaire used in this study originated from the 1998 Youth Risk Behavior Survey (CDC, 1999). The Youth Risk Behavior Survey is a nationally recognized study that uses a questionnaire consisting of six categories of priority health-risk behaviors among youth and young adults.

The questionnaire included basic demographic information, as well as self-report measures addressing topics including: how teens spend their time; health care issues; personal safety and violence; mental health; alcohol, tobacco, and drug use; diet and exercise; perceptions of the community, school, and friends; parent-teen relations; and sexuality. For this study, only variables regarding sexuality, family, and school were of interest.

Measures

All questionnaire items used in this study are listed in the Appendix. The Cronbach's alphas listed refer to the sample analyzed in this study.

Dependent Variable

Age at first intercourse. Age at first intercourse was determined by asking how old participants were the first time they had intercourse. Answers were, "I have never had intercourse", "11 years old or younger", "12 years old", "13 years old", "14 years old", "15 years old", "16 years old", and "17 years old or older". This variable was recoded so that "11 years old or younger" =1, "12 years old" =2, and so on, up to "I have never had intercourse"=8. Other items in the questionnaire asked participants whether they had ever had sex, how many partners they'd had, and whether they used birth control. The percentage of participants reporting they had never had sex was consistent across all of these questions, ranging from 35% to 37%. This uniformity adds reliability to the dependent variable.

<center>Independent Variables</center>

<u>Self-System</u>

  <u>Age</u>. Participants were asked to self-report their age as "12 years old or younger" (0), "13 years old" (1), "14 years old" (2), "15 years old" (3), "16 years old" (4), "17 years old" (5), or "18 years old or older" (6).

  <u>Gender.</u> Participants were asked to self-report gender, which was coded. Females were coded as "0", and males were coded as "1".

  <u>Ethnicity.</u> Participants were asked to self-report their ethnicity as "Asian," "Black or African American," "Hispanic or Latino," "Native American," "White/Anglo/Caucasian," "Mixed race/biracial," or "Other." Because of the very low percentages of participants representing ethnicities other than "Black or African American" or "White/Anglo/Caucasian", ethnic comparisons were done only between African American and White participants. This variable was recoded so that African American=0 and White=1.

  <u>Self-esteem.</u> The VARA includes Rosenberg's (1965) 10-item self-esteem scale. Topics covered include self-satisfaction, attitude towards self, sense of competency and worthiness, and self-respect. Participants answered on a four-point Likert-type scale from "strongly disagree" (1) to "strongly agree" (4). Five items were recoded so that a "1" response was negative and a "4" response was positive on all questions. For example, responses to the question, "At times I think I am no good at all" were recoded so that "Strongly disagree" (originally "1") was "4". These items were then combined into a scale by computing an average score. The Cronbach's alpha calculated was .83.

  <u>Delinquency.</u> Adolescents were asked how many times in the last six months they had participated in nine different delinquent behaviors, such as cheating in school, running away from home, stealing, and damaging property. This delinquency measure was adapted from Small and Rodgers (1995). Participants answered "never" (0), "1-2 times" (1), "2-3 times" (2), or "5 or more times" (3). These items were combined into a scale by computing an average score (alpha=.82).

  <u>Substance use.</u> Reports of substance use were measured with the same question for each of the following: tobacco, alcohol, and marijuana. This measure is consistent with those used in the Youth Risk Behavior Survey (CDC, 1999). For each substance, participants were asked on how many days out of the past 30 they had used that substance. Seven response options were "0 days" (0), "1 or 2 days" (1), "3 to 5 days" (2), "6 to 9 days" (3), "10 to 19

<center>31</center>

days" (4), "20 to 29 days" (5), and "all 30 days" (6). These three items were combined into a scale by computing an average score (alpha=.75).

Depression. Adolescent reports of depression were measured using three items. Participants were asked one yes-or-no question about feeling sad for more than two weeks, one yes-or-no question about planning a suicide attempt, and one question regarding the number of times in the last 12 months they had attempted suicide. This measure was adapted from the Youth Risk Behavior Survey (CDC, 1999). The yes-or-no questions were coded such that "no"=0 and "yes"=1. Suicide attempts was recoded so that "no"=0 and any other response (indicating at least one suicide attempt) =1. These items were combined in a scale by computing an average score (alpha=.60).

Parent Micro-system

Parent attachment. Adolescents' perceptions of attachment to their parents were assessed using a three-item measure (Small & Rodgers, 1995) intended to capture the essential elements of attachment. Items were "My parent(s) are good parents"; "My parent(s) care about me"; and "My parent(s) respect me." Participants answered "never" (0), "rarely" (1), "sometimes" (2), "most of the time" (3), and "always" (4). These items are similar to others used to measure parent attachment (Conley, 1999; Walsh, 1996; Lammers et al., 2000). Initially, these items were entered into a factor analysis, along with "How often do you spend time doing things for fun with family (other than watching TV)?" "How much do you worry about violence in your home?" "When was the last time you had a visit with a doctor/dentist?" The factor analysis revealed that the latter three items did not measure the same construct as the first three. The latter items were excluded from the analysis, and the first three items ("My parent(s) are good parents", "My parent(s) care about me", and "My parent(s) respect me") were combined as a scale by computing an average score (alpha=.81).

Adolescents' perceptions are important indicators of attachment. Parent and teen reports of attachment may differ, but Armsden and Greenberg (1987) point out that adolescent reports of attachment to parents are "significantly related to psychological well-being" for the adolescent (p. 427).

Parent separation. Parent separation was measured using one item: "Are your parents divorced or separated?" Answer options included "No," "Currently going through divorce or separation," "Divorced/separated within last 2 years," "Divorced/separated more than 2

years," and "My parents have never been married." Responses other than "No" were recoded as "1", and "No" remained "0".

Parental monitoring. Perceptions of parental monitoring were assessed using an eight-item measure (Small & Rodgers, 1995). Participants were asked how often each of the following was true for them: "My parent(s) know where I am after school"; "If I am going to be home late, I am expected to call my parent(s) to let them know"; "I tell my parent(s) whom I'm going to be with before I go out"; "My parent(s) know who my friends are"; "My parent(s) know the parents of my friends"; "My parent(s) know what I watch on television"; and "My parent(s) monitor my computer/Internet use". Participants chose from six possible responses: "never" (0), "rarely" (1), "sometimes" (2), "a lot of the time" (3), "always" (4), and "never" (5). These items were combined into a scale by computing an average score (alpha=.82). This scale and other, similar scales have been used widely to measure parental monitoring (Whitbeck et al., 1999; Rodgers, 1995; Small & Luster, 1994; Paikoff, 1995).

Parental communication. Adolescents' perceptions of parental communication were assessed using a seven-item measure (Small & Rodgers, 1995). The participants were asked how often in the past year they had communicated with one of their parents about each of the following: drugs and alcohol; sex and/or birth control; their job or educational plans; their personal problems/concerns; teachers or classes at school; dating; and things they enjoy. Participants could respond, "never" (0), "rarely" (1), "sometimes" (2), "a lot of the time" (3), "always" (4), and "never" (5). These items were combined into a scale by computing an average score (alpha=.81). Though the perceived type of communication (controlling, supportive, disinterested, involved) is not measured here, adolescent perceptions of the frequency of communication are important (Rodgers, 1999).

Parent values. Perceptions of parent values toward premarital sex and the importance of educational motivation and achievement were assessed using four items (Small & Rodgers, 1995). The first, "My parent(s)/guardian(s) think it is wrong for teens my age to have sexual intercourse if they are not married" was answered either "strongly disagree" (1), "somewhat disagree" (2), "somewhat agree" (3), or "strongly agree" (4). The last three questions, "How important is it to your parent(s) or other adult(s) you live with that you finish high school?" "How important is it to your parent(s) or other adult(s) you live with that you get good grades?" and "How important is it to your parent(s) or other adult(s) you live with that you get good grades?" were answered "not at all important" (0), "not really

33

important" (1), "somewhat important" (2), or "very important" (3). A factor analysis showed the latter three measured a similar construct, but the first question did not. These three were combined into a scale by computing an average score (alpha=.80). The question regarding parent attitudes about teens having sex was kept as a separate variable (parent sex values). Lammers et al. (2000) and Crockett et al. (1996) have used similar measures to assess the influence of parents' values on adolescents.

School Micro-system

School attachment. Eight items were used to assess school attachment. They were: "I enjoy going to school"; "Teachers in my school encourage me to do and be the best I can"; "Teachers in my school respect and listen to me"; "I believe I am getting a good, high quality education at my school"; "How often do you wear clothing with your school name, colors, or mascot on it?" "How often do you attend school events such as football games, dances, or concerts?" "How much do you worry about violence at school?" and "How much do you worry about fitting in with the other kids at school?" Response options for the first four were "strongly disagree" (0), "disagree" (1), "agree" (2), and "strongly agree" (2); options for the fifth and sixth items were "never", "sometimes", and "often". Options for the last two were "not at all", "a little", "some", "quite a bit", and "very much". A factor analysis revealed that only the first four questions measured a similar construct. They were combined into a scale by computing an average score (alpha=.77), and the other items were excluded from the analysis. These items strongly resemble those used in several assessments of school attachment and its influence on adolescence (Brown et al., 2000; McNeely et al., 2002; Dewitt, 1996; Goodenow & Grady, 1993).

Academic grades and motivation (time spent studying). Academic grades and motivation were measured separately by two items because a factor analysis showed these constructs to be unrelated. To assess academic grades, participants were asked what average grade they usually get in their courses at school. Eight response choices for this question were "mostly A's" (7), "about half A's & half B's" (6), "mostly B's" (5), "about half B's & half C's" (4), "mostly C's" (3), "about half C's and half D's" (2), "mostly D's" (1), and "mostly below D's" (0). To assess motivation (time spent studying), they were asked, "How often, on average, do you spend on weekdays after school doing homework or studying?" Ten response choices ranged from "never" to "daily, 7 or more hours per day". Both of these items were adapted from Small and Rodgers (1995).

Extracurricular activity participation. Participants responded to one item, adapted from Small and Rodgers (1995), which asked how much time they spent in school-related, non-sport extracurricular activities. Ten response choices ranged from "never" to "daily, more than 7 hours per day". These items were recoded so that "never"=0, "once a month for more than 1 hour"=1, "more than once a month but not weekly"=2, "once a week for more than 1 hour"=3, "twice a week for more than 1 hour"=4, "daily, less than one hour per day"=5, "daily, 1-2 hours per day"=6, "daily, 3-4 hours per day"=7, "daily, 5-6 hours per day"=8, and "daily, 7 or more hours per day"=9.

Future aspirations. Participants were asked how important each of the following is to them: getting good grades, finishing high school, getting a good job, and being involved with sports, clubs, events, or programs. Response choices were "not at all important" (0), "not really important" (1), "somewhat important" (2), and "very important" (3). When entered into a factor analysis, being involved with sports, clubs, events, or programs was shown to be unrelated to the construct measured by the first four items. Those four items were combined into a scale by computing an average score (alpha=.76), and the fifth item was excluded from the analyses. These items are consistent with those used by Whitbeck et al. (1996) and Donnell et al. (1999) in measuring the impact of future aspirations on adolescents' behavior.

CHAPTER IV

RESULTS

Profile Of The Sample

<u>Demographics</u>

Demographics for the analyzed sample are displayed in Table 2. Adolescents who were 14 years old or younger and who had never had sex were excluded from the analyses because it is impossible to determine whether they will have sex before or after age 15. The analyzed sample consisted of 1,757 participants, 851 (49%) of whom were female, and 871 of whom (51%) were male. The sample is not evenly distributed by grade; 5% were seventh graders, 7% eighth graders, 19% ninth graders, 28% tenth graders, 21% eleventh graders, and 20% twelfth graders. The sample participants reported their ethnicity as 53% "White or Caucasian", 40% "Black or African American", 1% "Native American", 2% "Mixed race or biracial", 2% "Other", .6% "Asian", and .8% "Hispanic or Latino".

Not quite half of the sample (47%) reported living with both a mother and a father (biological or adoptive). Twenty-two percent (22%) reported living in a blended family, and 17% said they live with their mother only. An additional 7% reported living with relatives. The other 7% of students reported living with a father only, living half with mother and half with father, living with a parent and a non-relative, living in a foster home, and/or living alone or with friends. Just over half (53%) also reported their parents were neither divorced nor separated. According to the respondents, 66% of participants' mothers and 72% of fathers work full-time. Respondents reported the vast majority of their parents (96% of mothers and 93% of fathers) had at least a high school education. About 51% of fathers and 44% of mothers did not continue education past high school, according to the adolescents in this survey.

Table 2
Demographics for analyzed sample (n=1,757)

	n	%			n	%
Gender				**Mother's work**		
Female	851	49.3		Full-time	1135	66.4
Male	871	50.6		Part-time	250	14.6
Age				Homemaker	149	8.7
12 or younger	24	1.4		Retired/disabled	72	4.2
13	93	5.4		Unemployed	52	3
14	148	8.6		Don't live with mother	38	2.2
15	509	29.5		Full-time student	14	0.8
16	446	25.4		**Father's work**		
17	378	21.9		Full-time	1215	71.5
18 or older	127	7.4		Part-time	86	5.1
Grade				Homemaker	20	1.2
7	85	4.9		Retired/disabled	82	4.8
8	116	6.7		Unemployed	45	2.6
9	324	18.8		Don't live with father	244	14.4
10	479	27.8		Full-time student	8	5
11	368	20.9		**Mother's education**		
12	348	19.8		Elementary or jr. high	75	4.4
Ethnicity				High school	686	40
Asian	11	0.6		Some college/tech	288	16.8
African American	694	40.4		2 year degree	169	9.9
Hispanic	14	0.8		4 year degree	223	13
Native American	20	1.2		Beyond 4 year degree	57	3.3
White	914	53.2		Graduate degree	64	3.7
Mixed race/biracial	36	2.1		Don't know	153	8.9
Other	29	1.7		**Father's education**		
Live with				Elementary or jr. high	115	6.7
Mother & father*	807	45.9		High school	753	44
Mother & stepfather	316	18.4		Some college/tech	246	14.4
Mother only	292	17		2 year degree	79	4.6
Relatives	115	6.7		4 year degree	175	10.2
Father & stepmother	54	3.1		Beyond 4 year degree	33	1.9
Half mom, half dad	48	2.8		Graduate degree	46	2.7
Father only	46	2.7		Don't know	266	15.5
Parent and nonrelative	23	1.3				
Alone or w/ friends	16	0.9				
Group/foster home	5	0.3				

* Biological or adoptive

<u>Sexual behavior</u>

Frequencies of participation in high-risk sexual behaviors are displayed in Table 3. Sixty-five percent (65%) of the analyzed sample said they had had sexual intercourse. Eight percent (8%), or 129 participants, said they first had intercourse at age 11 or younger; 9% (155 participants) said they first had intercourse at age 12; 13% (217 participants) said they were 13 when they first had intercourse; 12% (208) said they were 14 years old; 13% (218) said they were 15; 7% (121) said they were 16; and 3% (46 participants) said they were 17 years old or older the first time they had sexual intercourse. Thirty-five percent said they had never had sex. For those who reported having had sex, over one-quarter (26%) said they had intercourse for the first time at age 12 or younger, and almost half (46%) said they had intercourse at age 13 or younger.

In addition to early first intercourse, adolescents in this sample reported engaging in a number of other high-risk behaviors, as shown in Table 3. Among those who reported having had sex, 53% said they had "had sex during the past 30 days", and 53% said they had had intercourse with one or two partners. Thirty-one percent (31%) said they had had between three and five partners, and 15% said they had had intercourse with six or more partners. Eighteen percent (18%) of those who reported having had sex said they had used alcohol or drugs before they had sex the last time, and 34% said they did not use a condom the last time they had sex. Forty-four percent (44%) said they "never" or "rarely" used forms of birth control other than condoms; 35% said they "always" use another form of birth control.

Table 3

Frequencies of High-Risk Sexual Behaviors

	n	%		n	%
Ever had sex			Had sex within past 30 days		
Yes	1053	64.8	Yes	572	34.6
No	573	35.0	No	465	28.1
Age			Never had sex	615	37.2
11 or younger	129	7.7	Used alcohol and/or drugs before last sex		
12	155	9.2	Yes	199	12.0
13	217	12.9	No	855	51.6
14	208	12.4	Never had sex	604	36.4
15	218	13.0	Condom during last sex		
16	121	7.2	Yes	691	41.7
17	46	2.7	No	377	22.7
Never had sex	586	34.9	Never had sex	591	35.6
Number of partners			Use other birth control		
1	372	22.2	Never	374	22.4
2	207	12.4	Rarely	118	7.1
3	187	11.2	Sometimes	88	5.3
4	110	6.6	About half the time	34	2.0
5	49	2.9	Most of the time	82	4.9
6+	163	9.7	Always	376	22.5
Never had sex	584	34.9	Never had sex	596	35.7

Analyses

Quantitative analyses were performed using *SPSS for Windows v.10.0* (Norusis, 1999).
Three types of analyses were run to answer the research questions. First, a bivariate
correlation was used to determine the correlation of all of the independent variables to the
dependent variable and to each other. Second, linear regressions were used for the whole
sample as well as several subsamples to determine the influence of parent and school
attachment on age at first intercourse. Subsamples with varying levels of parent attachment
were included to assess the interaction effect. Subsamples divided by gender and ethnicity
were included to assess for effects of those variables on the dependent variable. Finally, to
determine the amount of variance accounted for by each system, all independent variables
were entered in blocks by system (self-system, family micro-system, and school micro-

system). This analysis also served to examine other predictors and to assess the influence of the main independent variables, parent and school attachment, when other variables are considered.

<u>Bivariate correlations</u>

Table 4 shows the results of the bivariate correlations. Note the large sample size in this study increases the tendency for correlations to be significant. The main independent variables, parent attachment and school attachment, were both positively correlated with age at first intercourse ($p<.001$), suggesting that participants who were more attached to parents and to school were older when they first had sex or had not had sex at all. Other self-system variables positively correlated with the dependent variable and significant at the $p<.001$ level were: hours spent studying each day, academic grades, and future aspirations. Delinquency, substance use, and depression were negatively correlated ($p<.001$) with age at first intercourse. Self-esteem was not significantly associated with age at first intercourse.

All family micro-system variables were significantly correlated with age at first intercourse. Parent attachment, parent communication, parental monitoring, parent values, and parent sex values were all positively and significantly correlated with age at first intercourse ($p<.001$). Parent separation was negatively and significantly correlated with age at first intercourse ($p<.001$).

Participation in school-based extracurricular activities was the only school micro-system variable not significantly correlated with the dependent variable. School attachment, academic grades, time spent studying, and future aspirations related to education and employment were all significantly correlated with later first intercourse ($p<.001$).

Table 4

Correlations between age at first intercourse, self-system, and micro-system variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age at first intercourse	1																		
2. Delinquency	-.28**	1																	
3. Self-esteem	.00	-.15**	1																
4. Substance use	-.27**	.48**	-.11**	1															
5. Depression	-.17**	.26**	-.40**	.24**	1														
6. Parental monitoring	.22**	-.35**	.15**	-.31**	-.17**	1													
7. Parental communication	.07**	-.17**	.16**	-.12**	-.05	.38**	1												
8. Parent values	.14**	-.28**	.18**	-.18**	-.17**	.31**	.27**	1											
9. Parent sex values	.25**	-.194**	.01	-.24**	-.12**	.26**	.11**	.18**	1										
10. Parent separation	-.18**	.03	-.03	.06*	.12**	-.09**	.05	-.03	-.14**	1									
11. Parent attachment	.08**	-.18**	.319**	-.17**	-.29**	.40**	.29**	.31**	.08**	-.06**	1								
12. School attachment	.11**	-.29**	.242**	-.29**	-.15**	.36**	.23**	.27**	.19**	.02	.25**	1							
13. Time studying	.16**	-.32**	.09**	-.26**	-.08**	.24**	.21**	.13**	.17**	-.03	.11**	.29**	1						
14. Extracurricular participation	.02	-.08**	.05*	-.11**	-.06*	.15**	.13**	.06*	.09**	-.03	.07**	.15**	.13**	1					
15. Academic grades	.21**	-.20**	.15**	-.21**	-.10**	.19**	.16**	.15**	.14**	-.12**	.12**	.23**	.23**	.13**	1				
16. Future aspirations	.20**	-.38**	.14**	-.33**	-.15**	.37**	.27**	.48**	.21**	-.03	.24**	.35**	.26**	.15**	.31**	1			
17. Age	.29**	.02	.02	.13**	-.04	-.15**	-.01	.04	-.05*	-.07**	.02	-.10**	-.02	-.06**	-.02	-.01	1		
18. Gender	-.12**	.203**	.10**	.13**	-.06*	-.13**	-.23**	-.11**	-.12**	-.03	-.00	-.08**	-.17**	-.08**	-.11**	-.20**	-.03	1	
19. Ethnicity	.33**	-.00	-.12**	.11**	.04	.10**	.00	.06*	.15**	-.21**	-.06*	-.08**	.06*	-.11**	.18**	.01	.12**	.01	1

Note: (*) indicates significant at .05, and (**) indicates significant at .001 (2-tailed test)

Linear Regressions

Parent attachment and school attachment. The results of the linear regressions of the two main independent variables are displayed in Table 5. Results are reported for five groups by parent attachment score. Possible answers on the questions in this scale were "never"=0, "rarely"=1, "sometimes"=2, "most of the time"=3, and "always"=4. Participants whose average score was equal to or less than 1 were classified as *lowest attached* (n=37). Participants whose scores averaged 2 or less were classified *low attached* (n=115). Scores between 1 and 3 were termed *moderately attached* (n=198). Those whose scores averaged 3 or higher were called *high attached* (n=1374), and those who scored 3.5 or higher were termed *highest attached*. It was the aim of this study to examine characteristics of adolescents with varying levels of parent attachment, and this sample had a very high overall level of parent attachment: the median split was 3.67, and the bottom quartile cutoff was 3.33. It was important, therefore, to select deliberately those who reported very low levels of parent attachment rather than to rely on statistical divisions to create these groups. Notice participants can be members of more than one group. These groups are intentionally not mutually exclusive so that the attachment differences between groups such as "low" and "lowest" can be determined.

These linear regressions suggest that the influence of school attachment on age at first intercourse varies by level of parent attachment in a curvilinear fashion. Adolescents at both extremes of the parent attachment scale (highest and lowest) seemed to be influenced by school attachment with regard to age at first intercourse, but those in the middle did not. For the whole sample ($F=11.019$, $R^2=.013$, df=2, 1613), school attachment was significantly predictive of age at first intercourse ($p<.001$), but parent attachment was not. Separate regressions on subsamples with lower and higher attachment to parents showed school attachment is a significant predictor of age at first intercourse for the adolescent participants *most* attached to their parents and *least* attached to their parents. Among participants who scored a 1 or lower on the parent attachment scale ($F=2.003$, $R^2=.103$, df=2, 35), school attachment was significant at the $p<.05$ level.

For those who scored 3 or higher on this scale ($F=7.088$, $R2=.010$, df=2, 1374), school attachment was significant at the $p<.001$ level. For participants who scored between 1 and 3 on the parent attachment scale, or those with moderate attachment to parents ($F=.026$, $R2=.000$, df=2, 198), school attachment was not a predictor of age at first intercourse at all. In other words, adolescents reporting the most and the least attachment to

Table 5
Linear regressions of parent and school attachment by level of parent attachment

	β	R^2	F
Whole sample (n=1,757)			
Model		.013	11.019
Parent attachment	.047		
School attachment	.095**		
Lowest parent attachment (<1) (n=37)			
Model		.103	2.003
Parent attachment	-.057		
School attachment	.330*		
Low parent attachment (<2) (n=115)			
Model		.007	.404
Parent attachment	.025		
School attachment	.075		
Moderate parent attachment (>1 & <3) (n=198)			
Model		.000**	.026
Parent attachment	-.007		
School attachment	.016		
High parent attachment (>3) (n=1374)			
Model		.010**	7.088
Parent attachment	-.014		
School attachment	.102**		
Highest parent attachment (>3.5) (n=956)			
Model		.016	7.649
Parent attachment	-.047		
School attachment	.121**		

Note: (*) indicates significant at .05, and (**) indicates significant at .001

parents also seem to be influenced by school attachment in terms of age at first intercourse. Those who report neither extreme—those in the middle—do not seem to be experience any such influence.

Gender and ethnicity. Regressions were also conducted by gender and ethnicity. These results are displayed in Table 6. Prior to running gender and ethnic comparisons, T-tests were conducted to determine overall levels of attachment for each group. In general, girls reported being significantly more attached to school (p<.001) than boys did, but there was no gender difference in reported level of attachment to parents. Whites reported being

significantly more attached to both school (p<.01) and parents (p<.01) than did African Americans.

Table 6
Linear regressions of parent and school attachment by gender and by ethnicity

	β	R^2	F
Girls			
Model		.027**	11.356
Parent attachment	.049		
School attachment	.147**		
Boys			
Model		.005	2.141
Parent attachment	.050		
School attachment	.041		
African Americans			
Model		.009	2.747
Parent attachment	.032		
School attachment	.082*		
Whites			
Model		.035**	15.693
Parent attachment	.073*		
School attachment	.153**		

Note: (*) indicates significant at .05, and (**) indicates significant at .001

Several gender and ethnic differences emerged from these analyses. Among all the gender and ethnic groups (girls, boys, African Americans, and Whites), boys were the only group for whom school attachment was *not* a significant predictor of age at first intercourse (F=2.14, R^2=.005, df=2, 789, p=.176). Across these same groups, parent attachment was only significant for Whites (F=15.69, R^2=.035, df=2, 869, p<.05). When gender and ethnicity were combined, as shown in Table 7, African American boys were the only group for whom school attachment was not a predictor of the dependent variable (F=.171, R^2=.001, df=2, 297, p=.834). It was significant at the p<.001 level for White girls (F=10.36, R^2=.046, df=2, 430) and significant at the p<.05 level for African American girls (F=6.19, R^2=.036, df=2, 331) and White boys (F=6.30, R^2=.028, df=2, 433). Parent attachment was only a significant predictor of age at first intercourse for White boys (p<.05). Attachment

Table 7

Linear regressions of parent and school attachment by gender and ethnicity combined

	β	R^2	F
African American girls			
Model		.036*	6.194
Parent attachment	.102		
School attachment	.147*		
White girls			
Model		.046**	10.360
Parent attachment	.049		
School attachment	.195**		
African American boys			
Model		.001	.171
Parent attachment	-.034		
School attachment	.012		
White boys			
Model		.028*	6.299
Parent attachment	.096*		
School attachment	.114*		

Note: (*) indicates significant at .05, and (**) indicates significant at .01

processes relating to school and parents seem to have complex relationships with gender and ethnicity.

Full-model regression

      All the variables in this study were entered into a regression in four blocks. Results are displayed in Table 8.

      The variables were entered in four blocks for several reasons. First, it allowed me to control for demographic factors by entering age, gender, and ethnicity together in the first block. Although they are self-system variables in the literal sense, age, gender, and ethnicity are unchangeable and therefore not considered personal characteristics, but rather demographic ones. Second, I was able to measure the relative influence of self-system, family micro-system, and school micro-system variables. The variables in the second block were delinquency, self-esteem, substance use, and depression. All of the parent micro-system variables (parent attachment, parental monitoring, parent communication, parent values, parent sex values, and parent separation) were entered in the third block. The school micro-

Table 8
Full model regression

	β	R²	R² change	F change (df)
Model 1		.170	.170**	79.92 (3, 1168)
Age	.282**			
Gender	-.119**			
Ethnicity	.249**			
Model 2		.313	.143**	60.41 (4, 1164)
Age	.302**			
Gender	-.067*			
Ethnicity	.281**			
Delinquency	-.138**			
Self-esteem	-.051			
Substance use	-.266**			
Depression	-.097**			
Model 3		.353	.040**	11.97 (6, 1158)
Age	.314**			
Gender	-.048			
Ethnicity	.227**			
Delinquency	-.103**			
Self-esteem	-.051			
Substance use	-.219**			
Depression	-.087*			
Parent attachment	-.064*			
Parental monitoring	.107**			
Parent communication	.008			
Parent values	.038			
Parent sex values	.130**			
Parent separation	-.084**			
Model 4		.357	.004	1.443 (5, 1153)
Age	.316**			
Gender	-.044			
Ethnicity	.213**			
Delinquency	-102**			
Self-esteem	-.061*			
Substance use	-.212**			
Depression	-.086*			
Parent attachment	-.062*			
Parental monitoring	.106**			
Parent communication	.006			
Parent values	.031			
Parent sex values	.128**			
Parent separation	-.078*			
School attachment	.004			
Extracurricular activities	-.014			
Time spent studying	-.020			
Academic grades	.070*			
Future aspirations	.000			

Note: (*) indicates significant at p<.05; (**) indicates significant at p<.001

system variables (school attachment, hours spent studying, extracurricular participation, academic grades, and future aspirations) were entered in the fourth block. I chose the block order based on ecological theory, which indicates the influence of these systems descends in this way (Bronfenbrenner, 1979).

The first block, or the demographic variables, accounted for a significant proportion of the variance in age at first intercourse ($F=79.92$, $R^2=.17$, $df=3$, 1168, $p<.001$). The second block, the individual characteristics in the self-system, also accounted for a significant amount of variance ($F=60.41$, $R^2=.14$, $df=4$, 1164, $p<.001$). Though it accounted for less, the parent micro-system block still figured significantly ($F=11.97$, $R^2=.04$, $df=6$, 1158,

$p<.001$). In this model, the school micro-system variables accounted for almost none of the change in the dependent variable ($F=1.443$, $R^2=.004$, $df=5$, 1153, $p=.206$). Though school attachment was positively and significantly correlated with age at first intercourse in the bivariate correlation as well as in the two-variable regression, it had no effect in the larger model. Parent attachment, which was positively and significantly correlated with the dependent variable in the bivariate correlation but not in any of the two-variable regressions, was significantly and *negatively* associated with age at first intercourse in the full model. Implications will be discussed in the next section.

CHAPTER V

DISCUSSION

The purpose of this study was threefold: 1) to determine whether school attachment was positively correlated with and predictive of later age at first intercourse; 2) to determine whether the influence of school attachment on age at first intercourse varied as a function of parent attachment level; and 3) to investigate the influence of school attachment and parent attachment relative to other factors in the self-system, parent micro-system, and school micro-system. In addition, this study explored the effects of gender and ethnicity on overall levels of attachment to school and to parents and on influence of school and parent attachment regarding age at first intercourse.

The unique contribution of this study is the contrast in results in the different analyses. Though the bivariate correlations and the two-variable regressions seem to support the first two research hypotheses, the block regressions with the full model of variables suggested that these two variables should not be considered in isolation. While parent attachment and school attachment seemed to be closely associated with later first intercourse, the full model regression presented a different picture. Parent attachment was predictive of *earlier* first intercourse, but school attachment was not predictive of age at first intercourse. Though a few studies have investigated various elements of the self-system, family micro-system, or school micro-system, only one other study has been published that assessed the effects of each of these (Resnick et al., 1997). In that study, however, researchers did not examine the relative influence of each, only the absolute influence. This study breaks new ground by demonstrating the necessity of the comparison of contexts when assessing risk factors for early first intercourse.

Findings

Because of the large sample used in this study, statistical significance in the findings is likely. The practical significance of these findings, which differs from statistical significance, is discussed in the implications section of this chapter.

Early first intercourse

48

Early first intercourse is clearly a concerning issue for participants in this study. Forty-eight percent (48%) of the population surveyed said they had had sex. Adolescence is a time of rapid sexual development (Paikoff, 1995) and most people have intercourse by the time they are 20 years old (Rosenbaum & Kandel, 1990). Early first intercourse (prior to age 15), however, comes with a host of associated risks (Greenberg et al., 1992; Rosenthal et al., 1994; Leitenberg & Saltzman, 2000). Of the 2, 329 participants in the whole sample, 609, or 32%, said they had lost their virginity before they were 15 years old. This rate is higher than the national average of 8%-30% (Miller & Dyk, 1993; CDC, 1999; AGI, 1999). Thirteen percent (13%), or 501 participants said their first experience of sexual intercourse was before age 13, which is almost twice the national average of between 7% and 9% of those under age 13 (CDC, 1999). Early first intercourse is prevalent for this population.

<u>Bivariate correlations</u>

<u>Main independent variables</u>

<u>School attachment.</u> Consistent with Small and Luster (1994), Conley (1999), and Whitbeck et al. (1999), this study found school attachment was correlated with later first intercourse for participants in this sample. The bivariate correlation matrix revealed a number of interesting associations. School attachment was significantly associated in the expected direction to every variable in the study, with the exception of parent separation, which may indicate that adolescents can maintain their level of school attachment regardless of their parents' marital status.

<u>Parent attachment.</u> Parent attachment was significantly associated in the expected direction with every variable except for age and gender. Much of the body of adolescent development literature indicates children modify their attachments to parents as they grow older (Allen & Land, 1993; Furman & Simon, 1999; Hill, 1980). These findings support the accompanying idea that children remain attached to their parents throughout the adolescent years, despite changes in the way attachment is manifested (Allen & Land; Furman & Simon; Hill).

<u>Self-system Variables</u>

Consistent with current research, higher reported levels of delinquency, substance use, and depression were all significantly correlated with early first intercourse (Subin, 1999; Rosenbaum & Kandel, 1990; Capaldi et al., 1996; Conley, 1999; Tapert et al., 2001); self-esteem was not (Donnelly et al., 1999).

49

<u>Parent Micro-system Variables</u>

Every parent micro-system variable measured was significantly correlated ($p<.001$) with the dependent variable in the bivariate correlations, which was consistent with the literature on these topics (Resnick et al., 1997; Whitbeck et al., 1999; Capaldi et al., 1996; Rodgers, 1999).

<u>School Micro-system Variables</u>

With the exception of extracurricular participation, school micro-system variables were also significantly correlated ($p<.001$) with the dependent variable in the bivariate, consistent with research on school variables (Resnick et al., 1997; McNeely et al., 2002; DeWitt, 1996).

<u>Linear regressions</u>

<u>The Effect of Parent Attachment on the Influence of School Attachment</u>

The influence of adolescents' perceived attachment to school on age at first intercourse varied as a function of their reports of feeling attached to parents. For those participants who said they felt the least attached to their parents, school attachment was a significant predictor of later first intercourse in the two-variable model ($p<.05$). The same was true for participants who reported the highest levels of attachment to parents ($p<.001$). For the adolescents who scored in the middle of the range, reported school attachment was not significant in predicting age at first intercourse. This finding is unique in the current body of literature, as no studies have investigated whether the influence of school attachment on age at first intercourse varies as a function of perceived parent attachment levels. Several studies have shown that school attachment is generally associated with later first intercourse (Resnick et al., 1997), and some have found school attachment to be a significant predictor in some regression models and not in others (Somers & Gizzi, 2001; Conley, 1999). Still others have shown other school micro-system variables, such as extracurricular participation and time spent studying were more so (Whitbeck et al., 1999).

This finding is important because it implies an interaction effect between parent attachment and school attachment. The main hypothesis of this study, that school attachment would be most predictive when parent attachment was low, was not supported. What is clear is that level of school attachment was predictive of age at first intercourse for adolescents in this study who were at both extremes of the parent attachment continuum. One potential explanation for this finding for lowest attached adolescents is that they may be

influenced more by micro-systems outside of their family than by a system they feel does not support them. These adolescents may be searching for an alternative attachment to supplement or replace the attachment they lack to their parents (Howes, 1999).

Adolescents who are the most attached to their parents, on the other hand, may be influenced by both parent and school micro-systems in a positive way. They may model their attachments in other contexts after the secure attachments they have to their parents, paralleling those parent relationships at school, and thereby reaping benefits from multiple systems simultaneously. Finally, adolescents who report moderate levels of attachment may have neither need to search for alternative attachments, as they are attached enough to their parents, nor reason to model attachments after their only-average attachments to their parents.

The Effects of Gender and Ethnicity on the Influence of School Attachment

This study found differences along gender and ethnic lines, as well as along combined gender/ethnic lines, in the influence of school attachment on age at first intercourse. Across gender, school attachment was significantly predictive of later first intercourse in the two-variable regressions only for girls (p<.001). In the ethnically divided regressions, African Americans' age at first intercourse was significantly affected (p<.05); Whites' was not. Though at least one study has found girls were more strongly affected by school-related variables with regard to age at first intercourse, they did not find that difference for school attachment (Whitbeck et al., 1999). No studies reported finding either gender or ethnic differences in influence of school attachment on age at first intercourse.

When ethnicity and gender were combined to form four groups (African American girls, African American boys, White girls, and White boys), school attachment was most predictive of later intercourse for White girls (p<.001). This was also true for African American girls and White boys (p<.05), but not for African American boys. This finding is significant because males and African Americans are the two groups most likely to have early first intercourse (CDC, 1999). In addition, T-tests in this study revealed boys reported lower levels of attachment to school than girls did, and African Americans reported lower levels of attachment to school than Whites did. These findings indicate further research is required to learn more about the interaction of ethnicity and gender for African American boys. It may be that they are the least affected by school attachment because they are far more affected by other variables, including gender and ethnicity. Interestingly, though girls in this study of

51

both races were more affected by school attachment, White boys were the only group in the combined gender/ethnicity, two-variable regressions significantly affected by parent attachment. No studies reviewed assess for or found such an effect.

<div align="center">Comparison of Contexts</div>

By regressing variables in blocks, I was able to determine the relative influence of each of the systems studied here: self-system, parent micro-system, and school micro-system. This emerged as the critical finding of this study.

Self-system

Demographics. Gender and ethnicity have overwhelmingly been shown to be predictive of age at first intercourse (Conley, 1999; CDC, 1999), and age has been shown to predict whether or not an adolescent has had sex (CDC, 1997; Rosenbaum & Kandel, 1990). Though they are self-system variables, they are demographic as opposed to psychosocial, so they were entered as the first of four blocks. In effect, this step controlled for the effects of demographic factors. Congruent with other findings (CDC, 1999; Miller & Dyk, 1993), the first block accounted for 17% of the overall variance in age at first intercourse for this sample. Surprisingly, gender was not predictive of age at first intercourse. This contradicts substantial evidence that boys have first intercourse younger than girls (CDC, 1997; CDC, 1999), and it means girls and boys in this sample become sexually active at the same pace on average. The rural setting of this sample may have something to do with this finding, but it is difficult to know why gender was not a significant predictor of age at first intercourse for this sample.

Being White was significantly predictive of having later first intercourse. This is congruent with many studies that find African Americans tend to have sex for the first time earlier than Whites do (CDC, 1997; CDC, 1999; SIECUS, 1997; Conley, 1999). Several studies have examined ethnic differences in age at first intercourse in terms of cultural values, rates of physical maturation, and socioeconomic status, and some have revealed that controlling for these variables did not change the ethnic differences (Miller & Dyk). This study did not include any of those variables, so it is impossible to know whether the ethnic effects would remain intact if it had been possible to control for those factors. Further research is indicated to determine what factors cause ethnic difference in age at first intercourse.

Age was positively predictive of age at first intercourse, meaning the higher the participants' reported age, the more likely they were to report having later first intercourse. This may be because of the exclusion from the analyses of virgins under the age of 15. The remaining (analyzed) sample was older, on average, than the original sample.

Psychosocial. The second block, the psychosocial variables of the self-system (delinquency, self-esteem, substance use, and depression), accounted for a substantial 14.3% of the overall variance in the participants' age at first intercourse. High scores in each of these areas were predictive of earlier first intercourse, findings that concurred with the majority of literature on these topics (Donovan & Jessor, 1985; Subin, 1999; Rosenbaum & Kandel, 1990; Lammers et al., 2000). Self-esteem was not correlated to age at first intercourse in the bivariate correlations, but it was predictive in this model. Literature on self-esteem varies; some (Whitbeck et al., 1999) have found high levels of reported self-esteem are correlated with later first intercourse, while others (Donnelly et al., 1999; Lammers et al., 2000) have found the opposite to be true. The results of this study may indicate that high self-esteem encourages some to seek sex, while it discourages others. This difference may dilute the overall statistical effect of self-esteem. The remaining psychosocial self-system variables (delinquency, substance use, and depression) are very well evidenced in the literature as associated with and predictive of earlier first intercourse (Donovan & Jessor; Crockett et al., 1996; Subin' Rosenbaum & Kandel; Lammers et al.).

While this study does not support the notion that sex at any time during adolescence is a problem behavior, as Problem Behavior Theory does, it offers validation that early intercourse occurs more frequently among adolescents who are having other problems as well. Despite the large amount of variance accounted for by self-system variables, an ecological perspective remains valuable because depression, substance abuse, and delinquency to not happen to adolescents in a vacuum. All positive contributions adults can make to adolescents' lives are relationship- and context-dependent, so it is still important to consider all the contexts in adolescents' lives.

Parent micro-system

The parent block, comprised of parent attachment, parental monitoring, parent communication, parent values, parent sex values, and parent separation, accounted for 4% of the overall variance in age at first intercourse. Two variables in this block predicted later first intercourse. One was adolescents' perception that their parents monitor them closely

(p<.001). Adolescents who reported their parents monitored their behavior closely were less likely to have early first intercourse than those who said their parents did not monitor their behavior closely. Recent studies conflict in their reports of the association between parental monitoring and early first intercourse. This study concurs with others that have found a strong link between parental monitoring and sexual activity (Rodgers, 1999; Small & Luster, 1994; Paikoff, 1995; Small & Kerns, 1993). Other studies have found the effect of parental monitoring varied, diminishing as adolescents aged (Whitbeck, 1999), and still others found monitoring was less significant than other parent variables, including attachment (Resnick et al., 1997). Monitoring was a primary predictor in the parent block of this regression analysis.

The other primary predictor in this block was adolescents' perception that their parents believe it is wrong for unmarried teens to have sex (p<.001). Those who reported their parents disapproved of premarital teen sex were significantly less likely to have early first intercourse than those who said their parents did not disapprove. Findings from several studies are consistent with this one (Resnick et al., 1997; Crockett et all, 1996; Small & Luster, 1994).

Two lesser predictors in the parent block are parent attachment and parent separation, both of which predict earlier first intercourse. While the finding that higher parent attachment is predictive of earlier first intercourse is surprising, it is important to remember that the sample studied reported very high levels of attachment to parents. The median split for this sample, on a scale from 0 ("never") to 4 ("always"), was 3.667, between "most of the time" and "always". Therefore, almost all participants fall into the high-attached category. However, many have also had sex early, so it appears that high levels of parent attachment are predictive of early first intercourse. Because the sample is skewed to the high end of the parent attachment scale, it is difficult to interpret the finding for the influence of parent attachment.

One potential reason for this counterintuitive finding is that significant other factors, unique to this community, are contributing to adolescents' decision to have sex. Adolescents in this sample have reported through quantitative data and in focus groups that the communities have a tremendous lack of recreational activities available for adolescents (Huebner & Morgan, 2001a, 2001b, 2002a, 2002b, 2002c). In teen focus groups, youth have reported they commonly have sex after school because they have nothing else to do (A. J. Huebner, personal communication, May 24, 2002). Too much unstructured time is a

problem not only because of the resulting boredom, but also because adolescents lack the opportunity to develop multiple attachments with caring adults in after-school activities. It is possible that the expected role of parent attachment is outweighed in this community by the pervasive boredom adolescents report, as well as by the dearth of opportunities to form multiple attachments with other, appropriate adults. This finding provides further explanation for the influence of monitoring by parents and others: those adolescents whose parents know where they are and what they are doing after school and at night, or who are being supervised by others, are less likely to be having sex at those times.

Parent separation is widely shown to be predictive of earlier first intercourse (Lammers et al., 2000; Crockett et al., 1996; Magnusson, 2000; Whitbeck et al., 1999), as it is in this study. Adolescents in this study who reported their parents were never married, were in the process of getting divorced or separated, or were already divorced or separated were more likely to have had early first intercourse than those who said their parents were married. Several studies suggest the essential risk element of parent separation is a decrease in parental monitoring when parents are not living together (Whitbeck et al., 1999; Magnusson, 2000). More research is needed to know whether parent separation would contribute to this model if parent monitoring levels were controlled.

Perceptions of parent communication and perceptions of parents' values about education and employment were the only non-significant parent micro-system variables in this model. Though some research supports the connection between parent-adolescent communication and age at first intercourse (Rosenthal et al., 2001), others point out that communication is a very complicated construct and its statistical influence depends greatly on the way it is measured (Zabin, 1990). The scale employed in the present study accounted for only the frequency with which adolescents perceived talking with their parents about various topics, not for the quality or type of conversation that took place. In addition, Rodgers (1999) points out that nuances of communication, such as controlling or supportive quality are important and that boys and girls differ in their responses to types of communication.

Only one study reviewed here found that parent values regarding achievement were a predictor of later first intercourse, and that finding was true only for boys (Lammers et al., 2000). It is not surprising, then, that in a model including boys and girls, parent values about achievement were not predictors of age at first intercourse.

Overall, parent micro-system factors seem to be important influences. It appears that adolescents' perceptions that their parents know where they are and what they are doing, along with their sense that their parents do not approve of early sex, help shape their decisions about having sex.

School micro-system

The school block, which included school attachment, time spent studying, extracurricular participation, academic grades, and future aspirations, accounted for very little of the variance in the dependent variable in this model (0.4%). Because of other researchers' findings that school micro-system variables, and particularly school attachment, were predictors of age at first intercourse (Conley, 1999), this finding was unexpected. Considering the impact of the other three blocks, however, it is clear that school micro-system variables need to be studied relative to the influence of other systems.

Within this block, only the academic grades variable was a significant predictor of age at first intercourse. Participants who reported higher grades were more likely to have later first intercourse than those who reported lower grades. Several published studies have found lower academic achievement is predictive of earlier first intercourse (Schvaneveldt et al., 2001; Lammers et al., 2000; Crockett et al., 1996). None reviewed for this study diverged from this association. This result was to be expected and is remarkable in that it was the only predictive factor in the school block.

School attachment was not predictive of age at first intercourse when considered with other variables, which contradicts several studies' findings (Conley, 1999; Resnick et al., 1997). Neither of these studies, however, either compared the influence of school attachment to the influence of other systems or assessed whether the influence of school attachment would vary as a function of parent attachment. While it is a significant predictor in isolation in this study, school attachment contributes little predictive value to a model that includes self-system (demographic and psychosocial) and parent micro-system variables, as well as other school micro-system variables.

Despite these results, school attachment should not be abandoned by researchers, either as a potential resource for adolescents, or as a protective factor for early first intercourse. School attachment is correlated with later first intercourse, which indicates that adolescents who report feeling attached to school are also likely to be the ones who wait until after early adolescence to have sex. In addition, perceived school attachment could

have indirect effects on age at first intercourse. For example, adolescents who report low levels of attachment to school are likely to feel alienated, isolated, and lonely (DeWitt, 1996), which could contribute to depression, a known risk factor for early intercourse. Finally, though school attachment does not account for statistical variance in the full model, that analysis compares it to unalterable factors, such as age, gender, and ethnicity. Of the variables that concerned adults can affect in order to help adolescents delay first intercourse, school attachment may still be an important one.

Neither extracurricular participation, nor future aspirations regarding education and employment, nor time spent studying had any predictive value for age at first intercourse in this model. Several studies supported the contribution of these factors (Whitbeck et al., 1999; Donnelly et al., 1999), but none compared the influence of these factors with the influences of other contexts. While these factors are positively correlated with age at first intercourse, this model indicates that other factors are more influential.

<div align="center">Strengths</div>

This study was based on a large, ethnically diverse, rural sample of adolescents. Many nationally representative studies, such as those based on the Add Health data, combine rural adolescents with urban and suburban adolescents, which does not provide the opportunity to look closely at rural adolescents' characteristics, needs, and strengths. Obviously, studies that focus on urban populations also cannot provide information about the ways in which rural adolescents are a distinct group. These results offer the opportunity to understand better the unique characteristics—strengths and weakness, needs and assets—of adolescents in one rural region with regard to early sexual behavior and attachment to parents and to school. Rural communities may be more closely-knit due to geographic isolation (Doebler, 1998), and adolescents, as seen in this sample, may be more highly attached to their parents and school. Future research on how rural schools, families, and communities create such attachments would be useful.

The relationship of school attachment and parent attachment was explored here. Though some studies have examined the correlation between school micro-system variables and parent micro-system variables (Whitbeck et al., 1999), none has investigated whether perceived school attachment varies by level of perceived parent attachment. This relationship is nonlinear, which was not expected. Further research is required to know what

unique influences affect adolescents who report moderate attachment to parents, as they do not seem to be influenced by school attachment in terms of age at first intercourse.

Most importantly, this study examines risk factors for early first intercourse using an ecological framework, which allows for the comparison of these factors across different contexts. Other studies have examined some elements of the self-system, parent micro-system, and school micro-system, but this is the first to examine all of these factors together and compare their relative influence on age at first intercourse.

In addition, this study used attachment theory as a framework, which no other study on school attachment and adolescents' age at first intercourse has done. This theory helps explain the needs young adolescents might be attempting to meet by having sex prior to age 15, as well as how alternative attachments, such as those to school, may supplement or substitute for attachments to parents.

<div align="center">Limitations</div>

<u>Sample</u>

The results of this study may only be interpreted to represent adolescents in this rural setting. They cannot be interpreted as representative of adolescents in all rural settings, nor can it be assumed that those who were absent, who did not participate, or who completed unusable questionnaires were comparable to those included in the analyses.

<u>Measures</u>

Because I used secondary data analysis, I was limited to constructs already included in the questionnaire and to the way the construct was measured. Some variables that have been documented as relevant and that might have been useful to add are: sexual abuse, unsupervised time with potential sexual partners, values about sex, perceived peer values about sex, peer sexual activity, intelligence, desire to be grown up at an early age, ability to restrain oneself, physical development or pubertal stage, and sibling sexual activity on adolescents' age at first intercourse.

I cannot determine based on the survey data whether adolescents were having intercourse with same-sex or opposite-sex partners, nor am I able to know how adolescents interpreted the term "intercourse" (as oral, vaginal, digital, etc.). This study, therefore, does not distinguish between heterosexually identified, homosexually identified, and bisexually identified adolescents. Further research is required to determine whether influences on age at

first sexual intercourse are shared by adolescents of all sexual orientations or whether some markers are relevant only to certain groups.

Analyses

The block-entered regression is inherently biased toward the variables entered first. The school micro-system variables, when entered last, had virtually no predictive value as a block. When entered first, however, followed by demographic, psychosocial, and family micro-system blocks, the school block accounted for 7% of the variance, and the family block, entered last, accounted for only 3.5%. School attachment remained insignificant even in this reconfiguration. Demographic and psychosocial variables still accounted for the most variance (15% and 9.8% respectively), underlining the importance of each over the school and family blocks. While it is valuable to base entry into a regression on theory, it is also important to remember the resulting bias in this analysis. This analysis' inconsistency with ecological theory may indicate a need for some revision of the theory.

In addition, it is important to note that when only those participants who reported having had sex prior to age 13 (n=259) were included in the full block regression, almost none of the above-reported predictors remained intact, and parent attachment emerged as one of only two significant and positive predictors for age at first intercourse. These findings directly contradict those for the larger analyzed sample and indicate this sub-sample is affected by many variables not measured here (e.g. sexual abuse). This would be an excellent area for further research.

<div align="center">Implications</div>

The most significant implications of this study are for future research. Comparing contexts was shown to be extremely important in this study, and it may be important for studies of other phenomena as well. Using ecological theory provides rationale for conducting such a comparison.

The influence of self-system factors has implications for parents, educators, clinicians, and others who work with young adolescents. Because these elements are so substantial in the prediction of early first intercourse, adults who see depression, substance use, and delinquency in adolescents need to know these teens are at increased risk for early sexual intercourse. Clinicians who notice these symptoms present in an adolescent client should make a concerted effort to assess the adolescent's risk for early intercourse.

Education about the risks of early sexual intercourse may be particularly useful to those adolescents.

The importance of the parent micro-system, and the distinction between positive predictors and negative or non-predictors can help parents focus their energy on parent-child dynamics that are shown to have a strong effect. For families that seek therapy, clinicians who have this knowledge can help teach parents about parenting practices that seem to help protect against early first intercourse.

Parental monitoring is associated with age at first intercourse, and parent separation is associated with a decline in monitoring. Nonparticipation in after-school activities has the potential to reduce the number of attachments adolescents can make to caring adults. In addition, boredom may combine with those factors to create high risk for early sexual intercourse. These findings suggest that engaging and occupying adolescents may be a protective factor for age at first intercourse. In addition, it seems important for separated parents to take steps to ensure their children are well monitored despite the separation.

Many parents may not feel it is important to state explicitly that they disapprove of early first intercourse, but adolescents in this sample who indicated they believed their parents did were less likely to have early first intercourse. It is impossible to know how teens came to that conclusion, whether through direct conversation or more implicit means, but parents who do not want their children to have early first intercourse may want to consider making their feelings clear. It is important to note that some research shows negative attitudes towards sex in general are predictive of earlier first intercourse, so a combined message—that sex is healthy and appropriate, but at the right time, with a committed partner, and while using protection—may be best (SIECUS, 1997; Casper, 1990; Chilman, 1990; Christopher & Roosa, 1990). Because such a large portion of adolescents will become sexually active before they turn 18 (CDC, 1999), school professionals, clinicians, and parents may wish to discuss disease prevention and birth control methods with adolescents. Clinicians need to inquire about parents' values regarding sex so they can assist parents in developing appropriate messages to communicate to their children.

Recent studies have emphasized the potential impact of school attachment on a number of adolescent behaviors (Resnick, 1997; McNeely et al., 2002). This concept was supported by the bivariate correlations and the linear regressions of school and parent attachment. These analyses revealed correlation and predictive value of school attachment

for the dependent variable. The lack of a finding in this study that school attachment is indeed a predictor of age at first intercourse when compared to other contexts indicates a need for further, careful research of this concept. While it makes sense to think attachment would be a significant school-related factor, this study does not support that notion. It may, however, be very relevant to other phenomena not studied here, such as future achievement, future income, or future attachments to work and other micro-systems. This is an interesting new area of study, and though it does not seem to have statistical significance with regard to early sexual intercourse, the practical value of adolescents' attachments to school should not be underestimated.

Conclusion

Though school attachment did vary as a function of parent attachment and was correlated to later first intercourse, neither school attachment nor any other school micro-system variable had a significant role in predicting adolescents' age at first intercourse when other contexts were included in the analyses. The results indicate many factors are involved in this prediction, and that they should be studied in comparison to each other, not simply in isolation.

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APPENDIX

Measures Used In The Analysis Of Data

Dependent Variable

Age at first intercourse.143. How old were you when you had sexual intercourse for the first time? 0=I have never had first intercourse; 1=11 years old or younger; 2=12 years old; 3=13 years old; 4=14 years old; 5=15 years old; 6=16 years old; 7=17 years old

Independent variables

Self-system

Age. 1. How old are you?   0=12 years old or younger; 1= 13 years old; 2=14 years old; 3=15 years old; 4=16 years old; 5=17 years old; 6=18 years old or older

Gender. 2. What is your sex?   0=Female; 1=Male

Ethnicity. 4. How do you describe yourself? 0=Asian; 1=Black or African-American; 2=Hispanic or Latino; 3=Native American; 4=White/Anglo/Caucasian; 5=Mixed race/biracial; 6=Other

Self-esteem. (Responses for the following 10 questions are: 1=Strongly disagree; 2=Somewhat disagree; 3=Somewhat agree; 4=Strongly agree.)

164. I take a positive attitude about myself.

165. All in all, I am inclined to feel that I am a failure.

166. I feel I do not have much to be proud of.

167. On the whole, I am satisfied with myself.

168. At times I think I am no good at all.

169. I am able to do things as well as most other people.

170. I feel that I have a number of good qualities.

171. I certainly feel useless at times.

172. I feel I'm a person of worth, at least on an equal plane with others.

173. I wish I could have more respect for myself.

Delinquency. 155-163: Please be as honest as you can when answering the following questions. Remember, your answers are completely confidential. Over the past 6 months, how often have you: (Responses for these 9 questions are: 0=Never; 1=1-2 times; 2=3-4 times; 3=5 or more times.)

155. Cheated on a class test?

156. Skipped school without a legitimate excuse?

157. Used a fake ID?

158. Run away from home?

159. Drove a car without the owner's permission?

160. Purposely damaged property that didn't belong to you? (e.g. school bathrooms, lockers, etc.)

161. Taken something from a store without paying for it?

162. Broke into some place like a car or building?

163. Got into trouble with the police?

Substance use. 74. During the past 30 days, on how many days did you smoke cigarettes, cigars, or use chewing tobacco products?   0=0 days; 1=1 or 2 days; 2=3 to 5 days; 3=6 to 9 days; 4=10 to 19 days; 5=20 to 29 days; 6=All 30 days

77. During the past 30 days, on how many days did you have at least one drink of alcohol? 0=0 days; 1=1 or 2 days; 2=3 to 5 days; 3=6 to 9 days; 4=10 to 19 days; 5=20 to 29 days; 6=All 30 days

80. During the past 30 days, how many times did you use marijuana (dope, pot, weed)?

Depression. The next 3 questions ask about sad feelings and attempted suicide. Sometimes people feel so depressed about the future that they may consider attempting suicide, that is, taking some action to end their own life.

152. During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?   0=No; 1=Yes

153. During the past 12 months, did you make a plan about how you would attempt suicide? 0=No; 1=Yes

154. During the past 12 months, how many times did you actually attempt suicide? 0=0 times; 1=1 time; 2=2 or 3 times; 3=4 or 5 times; 4=6 or more times

Parent micro-system

Parent attachment. (Responses for the following three questions are: 0=Never; 1=Rarely; 2=Sometimes; 3=Most of the time; 4=Always.)

99. My parent(s) are good parents.

100. My parent(s) care about me.

101. My parent(s) respect me.

Parent separation. 6. Are your parents divorced or separated?0=No; 1=Currently going through divorce or separation; 2=Divorced/separated within last 2 years; 3=My parents have never been married

Parental monitoring. Indicate how often the following statements are true for you. Remember: answer about your parents or the adults you live with. Overall: (Responses for the following 8 questions are: 0=Never; 1=Rarely; 2=Sometimes; 3=Most of the time; 4=Always.)

102. My parent(s) know where I am after school.

103. If I am going to be home late, I am expected to call my parent(s) to let them know.

104. I tell my parent(s) whom I'm going to be with before I go out.

105. When I go out at night, my parent(s) know where I am.

106. My parent(s) know whom my friends are.

107. My parent(s) know the parents of my friends.

108. My parent(s) know what I watch on television.

109. My parent(s) monitor my computer/Internet use.

Parental communication. How often, in the past year have you communicated with one of your parents (or other adult you live with) about each of the following? Remember, answer about the adults you live with. (Responses for the following 7 questions are: 0=Never; 1=Rarely; 2=Sometimes; 3=Most of the time; 4=Always.)

112. Drugs and alcohol

113. Sex and/or birth control

114. Your job or education plans after high school

115. Your personal problems/concerns

116. Teachers or classes in school

117. Dating

118. Things you enjoy (for example, movies, video games, clothes, sports)

Parent values. How important is it to your parent(s) or other adult(s) you live with that: (Responses for the following 5 questions are: 0=Not at all important; 1=Not really important; 2=Somewhat important; 3=Very important.)

121. you finish high school?

122. you get good grades in school?

123. you have a boyfriend/girlfriend or go out on "dates"?

124. you are involved with something like sports, school events or community or school based afterschool programs (Girl/Boy Scouts, 4-H, FFA, yearbook, language, etc.)?

125. get a good job when your formal education (high school, college, trade/tech school, etc.) is finished?

Parent sex values. 120. My parent(s)/guardian(s) think it is wrong for teens my age to have sexual intercourse if they are not married.   1=Strongly disagree; 2=Somewhat disagree; 3=Somewhat agree; 4=Strongly agree

School micro-system

School attachment. (Responses for the following 4 questions are: 0=Strongly disagree; 1=Somewhat disagree; 2=Somewhat agree; 3=Strongly agree.)

131. I enjoy going to school.

132. Teachers in my school encourage me to do the best I can.

133. Teachers in my school respect and listen to me.

134. I believe I am getting a good, high quality education at my school.

Academic grades. 137. What are the average grades you usually get in your courses at school?   0=Mostly A's; 1=About half A's & half B's; 2=Mostly B's; 3=About half B's & half C's; 4=Mostly C's; 5=About half C's & half D's; 6=Mostly D's; 7=Mostly below D

Motivation (time spent studying). Here are some things students may do on weekdays, after school. Mark how often, on the average, you spend in each activity. If there is something you never do, mark "never" or "0" for that activity.

13. Doing homework, or studying   0=never; 1=daily, less than one hour per day; 1=daily, 1-2 hours per day; 3=daily, 3-4 hours per day; 4=daily, 5-6 hours per day; 5=daily, 7 or more hours per day; 6=once a week for more than 1 hour; 7=twice a week for more than 1 hour; 8=once a month for more than 1 hour; 9=more than once a month but not weekly

Extracurricular participation. Here are some things students may do on weekdays, after school. Mark how often, on the average, you spend in each activity. If there is something you never do, mark "never" or "0" for that activity.

19. In school-related, non-sport extracurricular activities (FFA, pep club, drama, band, academic clubs, etc.)   0=never; 1=daily, less than one hour per day; 1=daily, 1-2 hours per day; 3=daily, 3-4 hours per day; 4=daily, 5-6 hours per day; 5=daily, 7 or more hours per day; 6=once a week for more than 1 hour; 7=twice a week for more than 1 hour; 8=once a month for more than 1 hour; 9=more than once a month but not weekly

Future aspirations. How important is it to you that you: (Responses for the following four items are: 0=Not at all important; 1=Not really important; 2=Somewhat important; 3=Very important.)

58. finish high school?

59. get good grades in school?

61. go to college?

62. get a good job when your formal education (high school, college, trade/tech school, etc.) is finished?