

ENVIRONMENTAL RISK FACTORS AND RISKY SEXUAL BEHAVIOR  
OUTCOMES: ATTITUDES AS A MEDIATING FACTOR

---

A Dissertation presented to the Faculty of the Graduate School  
University of Missouri-Columbia

---

In Partial Fulfillment of the Requirements for the Degree  
Doctor of Philosophy

---

by  
CONSTANCE M. BROOKS

Dr. Craig Frisby, Dissertation Supervisor

MAY 2007

The undersigned, appointed by the Dean of the Graduate School,  
have examined the dissertation entitled,

ENVIRONMENTAL RISK FACTORS AND RISKY SEXUAL BEHAVIOR  
OUTCOMES: ATTITUDES AS A MEDIATING FACTOR

Presented by Constance M. Brooks

A candidate for the degree of Doctor of Philosophy

And hereby certify that in their opinion it is worthy of acceptance.

---

Craig Frisby, Ph.D.

---

Jessica Summers, Ph.D.

---

Greg Holliday, Ph.D.

---

Barbara Williamson, Ph.D.

---

Debora Bell, Ph.D.

## DEDICATION

Although experts might advise those writing a dissertation to rely on current empirical data, sound statistical procedures, and well-known writing guides, I found it most beneficial to rely on family and friends throughout this process. The encouragement and emotional support of those I love was unwavering and so very much appreciated.

For as long as I can remember, my parents have encouraged me to set high standards for myself and to work hard to reach my goals. When they've told me how proud they are of me, it has always made me work harder to give them more to be proud of. *Thank you Mom and Dad for all your support and love and for guiding me toward success.*

Many thanks also to my sister, Dee Ann, who called often to check the progress of the study and to make sure I was still sane! Dee Ann's constant reassurance was calming and helped me keep things in perspective. *Thanks little sister.*

I've been fortunate to have many friends and family members who care about me and encouraged me to do my best. I extend my warmest gratitude to my long-time friends, extended family, in-laws, schoolmates, and colleagues. *Thank you everyone.*

Although my daughter Peyton is only 4, she has contributed to this work in ways she does not realize. Many weekends and evenings Peyton visited friends and family members so that her mother could work uninterrupted on the computer, to be followed with quality mother-daughter time with the computer off! I am also inspired by my daughter to put forth my best efforts and to role model persistence, determination, and lofty aspirations so that she may too set and achieve high goals for herself. Finally,

Peyton's sweet smile and infectious laugh brought me back to reality on many occasions when stress set in, to remind me of my priorities. *I love you princess.*

Words cannot describe how grateful I am for my husband, Aaron. When we got married, Aaron knew that I would be in school for "the long haul" and he has hardly known a time when I wasn't a student. Not only did he volunteer to complete weekly mundane household tasks to free up my time during this process, he did them without complaint. He checked frequently to make sure I was on track with my dissertation to-do list and gave me big hugs after long writing stints. He even feigned interest in statistics when I excitedly talked through my results! Sometimes I can't believe how fortunate I am to have such a thoughtful and caring partner. I look forward to reciprocating Aaron's kindness and care to demonstrate my commitment to our relationship. *I love you sweetie!*

*We made it!*

## ACKNOWLEDGMENTS

Even with all the good wishes and encouragement from family and friends, a doc-student cannot survive without the aid and support of a strong dissertation committee.

First, I want to extend special thanks to Dr. Craig Frisby for his commitment and attention to this study and to me as a professional. Dr. Frisby stepped into the advisor role and immediately appraised the progress of this work, offering constructive criticism and compliments. His timely feedback and responses to frantic questions was reassuring. Although I have always held Dr. Frisby in high regard, his strong commitment to my dissertation has deepened my respect for him. *Dr. Frisby, thank you for joining the committee at a late date and providing much needed support.*

Additionally, I'd like to express my deep gratitude to Dr. Jessica Summers for sharing her statistical knowledge, for guiding me through this process, and expecting me to set and meet extremely high standards. *Dr. Summers, I don't know how I would have made it through this process without your guidance. I admire your work ethic and am truly grateful for your assistance.*

Drs. Greg Holliday, Barbara Williamson, and Debora Bell were pivotal in my professional development and dissertation research as well. Dr. Holliday has met with me numerous times to listen to my concerns, help me problem-solve solutions, and to remind me of my strengths. A strong model of professionalism, Dr. Williamson has shared my enthusiasm for different projects and helped me prioritize my career and family goals for life after graduation. Dr. Bell's constructive comments regarding my dissertation ideas and drafts were extremely helpful in getting me to critically think through relevant concepts. The questions she posed were challenging and taught me many facets of

research that I would have not been exposed to otherwise. *Thank you so much for being more than “just” committee members—for being inspiring mentors.*

I would be remiss if I did not express my gratitude to Dr. Meghan Davidson, who created the Adolescent Attitudes Regarding Dating Relationship scale (AARDR) for her dissertation research. Creating a standardized measure is a major undertaking and few students choose this type of project for their dissertation because of the massive amount of work involved. Dr. Davidson not only created an instrument in an area of need, but she did so exceptionally well by using focus groups, pilot studies, and solid empirical methods---all before she graduated. She has been helpful and cooperative in allowing me to use the AARDR. *Dr. Davidson, I look forward to following through with our collaboration plans in the future.*

Finally, I want to express my gratitude to the school administrators, school staff, and students who participated in the study. Without their cooperation, flexibility, and openness this study would not have been possible.

# ENVIRONMENTAL RISK FACTORS AND RISKY SEXUAL BEHAVIOR

## OUTCOMES: ATTITUDES AS A MEDIATING FACTOR

Constance M. Brooks

Dr. Craig Frisby, Dissertation Supervisor

### ABSTRACT

The goal of this study was to examine environmental risk factors for risky sexual behaviors and, using an attitude measure designed specifically for adolescents, determine the mediating effects of attitude between risk factors and risky sexual behavior outcomes. The study is grounded in Bronfenbrenner's (1977, 1979) ecological systems theory in that risk factors from participants' "systems" of influence are examined. Subjects were recruited from four mid-western public schools, female, and ranged in age from 14 to 17. Participants completed measures to assess the presence and severity of risk factors for risky sexual behaviors and to identify sexual behaviors of the teens. Additionally, participants completed the Adolescent Attitudes Regarding Dating Relationships scale (AARDR), a theoretically derived, gender-specific quantitative instrument that measures high school-aged adolescents' attitudes regarding dating relationships (Davidson, 2005). Three models were examined using structural equation modeling to determine the impact of attitudes on sexual behaviors, with and without consideration for other risk factors. Results indicated that the model with a direct path between attitudes and sexual behavior outcomes was the best fit to the data collected. Implications for treatment include utilizing an attitudinal measure to identify "at-risk" teens for risky sexual behaviors and cognitive therapy focused on attitude change. Additional suggestions for future research and applied practice are discussed.

## LIST OF FIGURES

1. Bronfenbrenner's Ecological Model.....	9
2. Measurement Model.....	81
3. Model #1: Path Diagram between Environmental Risk Factors and Risky Sexual Behavior Outcomes.....	86
4. Model #2: Path Diagram between Attitudes and Risky Sexual Behavior Outcomes.....	91
5. Model #3: Path Diagram between Environmental Risk Factors and Risky Sexual Behavior Outcomes, with Attitudes as a Mediating Factor.....	93



## LIST OF TABLES

1. Participant Demographics.....	75
2. Chi-squared Differences Between Models.....	82
3. Correlations of SEM Model #1 Variables.....	87
4. Correlations of SEM Model #2 Variables.....	92
5. Correlations of SEM Model #3 Variables.....	94
6. AARDR items in Relation to Ecological Systems Theory.....	101
7. Frequencies of Reported Participant Relationship/Sexual Behaviors.....	113
8. Variable Means, Standard Deviations, and Internal Consistencies.....	114
9. Model Comparisons of Goodness of Fit Data.....	120
10. Significant Variables in Regression Models.....	128

## TABLE OF CONTENTS

DEDICATION	
ACKNOWLEDGEMENTS	ii
ABSTRACT	iv
LIST OF FIGURES	v
LIST OF TABLES	vi
CHAPTER ONE: INTRODUCTION	1
CHAPTER TWO: REVIEW OF THE LITERATURE	8
Theoretical Basis: Bronfenbrenner's Ecological Systems Theory	9
Risky Sexual Behavior	14
Jessor's Problem Behavior Theory Adolescent Decision Making	17
Prevalence and Consequences of Adolescent Sexual Behaviors	19
Adolescent Decision-Making	23
Attitudes Related to Sexual Behavior	25
The Microsystem: Individual Variables	29
The Mesosystem: Familial and Extra Familial Variables	44
The Exosystem: Population Density, Poverty, and Arrest Rates	59
The Macrosystem: Race, Institutional Barriers, the Media, and Technology	61
Self-Report Issues	65
Focus of the Current Study	68
CHAPTER THREE: METHOD	71
Subject Recruitment	71

Subject Characteristics	73
Institutional Review Board Approval	74
School Solicitation	74
Parental Consent	76
Youth Assent	77
Incentives	77
Setting and Apparatus	78
Procedures	78
Design and Analysis	79
Instruments	90
Demographic Questionnaire	90
Sexual Activity	98
Peer Perceptions	100
Adolescent Attitudes Regarding Dating Relationships Scale	100
Balanced Inventory of Desirable Responding	104
Youth Self-Report Scales	105
Perception of Parents Scales	106
CHAPTER FOUR: RESULTS	109
Data Screening	109
Descriptive Statistics	110
Structural Equation Modeling	117
Post-hoc Analyses	121
Regression Models Examining SEM Models #1 and #3	122

Regression Models Examining SEM Model #2	126
Significant Relationships	127
CHAPTER FIVE: DISCUSSION	130
Discussion of the Results of the Hypothesis	130
Relationship of the Results to Previous Research and Theory	133
Limitations of the Current Study	136
Implications for Future Research and Practice	142
Conclusion	150
REFERENCES	151
APPENDICES	177
VITA	200

## CHAPTER ONE: INTRODUCTION

As Erikson (1975) noted in his psychosocial theory of development, adolescence is a time when a teen focuses on the formation of identity and a coherent self-concept, as she faces the task of identity versus role confusion. This is a time when a teen tries to establish herself as an individual, capable of taking care of herself; no longer a child, yet still not an adult. Or perhaps Janet Jackson better characterized adolescence singing, “Got my own life. I want to make my own decisions. If it has to do with my life, my life. I wanna be the one in control” (Harris & Lewis, 1986). Parents of teenagers can likely relate to Jackson’s lyrics.

Furman and Shaffer (2003) describe several developmental tasks faced by adolescents which include (a) identity development, (b) the transformation of family relationships, (c) the development of close relationships with peers, (d) the development of sexuality, and (e) scholastic achievement and career planning. These tasks involve not only the individual, but also the systems in which she exists (i.e. family, peer group, and school). No doubt, the accomplishment of one of these tasks impacts the others, in both positive and negative ways. The focus of this study is on the developmental task of sexual development, when sexual behavior becomes problematic, and why this occurs, posed in the context of the teen’s “systems”. The importance of the influence of systems is a concept central to Bronfenbrenner’s (1977, 1979) ecological systems theory, which seems an appropriate guiding theoretical basis for this study.

When considering the outcomes of problematic behaviors, it is also important to consider the precursors of such behaviors. Adolescence is a period characterized by a

high frequency of risk behaviors (Holinger, 1981; Jessor & Jessor, 1977; Zuckerman, 1971; Zuckerman, 1979), many of which have negative outcomes. Unfortunately, adolescents experience the negative consequences of risky behaviors to a disproportionately high degree (Dryfoos, 1990). To determine which children are more likely to be involved in risky behaviors, thus experiencing the negative consequences, children are identified as “at risk.” The term “at risk” has been used repeatedly throughout the literature and has indeed pervaded the common lexicon. “At-risk” represents a stage before an individual has engaged in risk behaviors and a time during which prevention seems appropriate and urgent. When a child is deemed “at risk”, thoughtful clinicians consider many factors in determining how “at-risk” the child is by considering the number and intensity of risk/protective factors present and the pervasiveness of risk/protective factors across domains (Jessor, 1991). The balance between risk and protection results in the degree of risk for the child. Research involving children frequently examines these factors in hopes of reducing risk and preventing a child from reaching the “at-risk” stage. Thus, the current study identifies the levels of individual and environmental risk factors when assessing the connection between risk factors and sexual behavior outcomes.

Although many teens with numerous risk factors lead lives that include risky sexual behaviors, some do not, and the reason for this difference needs to be explored in order to better understand prevention efforts. Perhaps the attitudes regarding sexual behaviors held by the teen influences the teen’s behaviors and determining whether she engages in risky sexual behaviors. The literature on how teens make decisions is inconclusive and includes reference to the influence of optimistic bias, risk perceptions, inexperience with

consequences of poor decisions, and cognitive abilities related to decision-making skills. Harris, Duncan, and Boisjoly (2002) note, “adolescents possess the cognitive abilities to formulate rational behavioral intentions based on perceived attitudes about the risk and benefits associated with engaging in such behavior” (p.1010). Other researchers report that experience in the absence of negative consequences may increase feelings of invulnerability and thus explain the decrease in risk perceptions from early to late adolescence, as exploration increases (Reyna & Farley, 2006). As with many adult decisions, it is likely that teenagers consider the benefits and consequences of their decisions, but give more weight to immediate gratification and peer acceptance than adults would. So how does a teenager determine what factors of a decision get “more weight,” or what factors are important to them? How do teens’ attitudes factor into decision-making regarding behaviors? These questions lead us back to Bronfenbrenner’s (1977, 1979) ecological systems theory and the influence different systems have on teens. For example, Abrahamse, Morrison, and Waite (1988) indicate that characteristic reproductive patterns across racial groups implicate attitudinal differences toward teenage pregnancy. Specifically they report that these attitudes are embedded in personal characteristics and social and contextual factors which contribute to the risk of early pregnancy and parenthood (Abrahamse et al., 1988). In the current study, attitudes toward sexual behaviors were measured using the Adolescent Attitudes Regarding Dating Relationships scale (AARDR; Davidson, 2005). The amount of impact of attitudes and risk factors on sexual behavior outcomes was compared to the impact of risk factors, without accounting for attitudes, on sexual behavior outcomes.

One of the conceptual difficulties in previous research examining developmental tasks is that, some level of the risky behavior is expected. When a behavior emerges too early, or is demonstrated too often or too intensely, it can be viewed as problematic. For instance, sexual activity is discouraged or regarded as a problem behavior in early adolescence; it is sometimes accepted and regarded as normal behavior in later adolescence (Focus Adolescent Services, 1999; Jessor & Jessor, 1975). Clear criteria for when a behavior is deemed “problematic” are important; therefore, the current study uses explicit criteria for each behavior outcome, created from reviewing the literature. Specifically, problematic sexual behavior outcomes, referred to as risky or high-risk sexual behaviors, are defined as early age of first sexual experience, having had a sexually transmitted disease (STD) or pregnancy, a high number of sexual partners, and/or low frequency of contraception use.

In addition to clear operationalization of dependent variables, thorough understanding of the precursors, or risk factors, associated with risky sexual behaviors is warranted. Various studies have identified different risk factors for risky sexual behaviors, which are detailed in this study. Langer, Warheit, and McDonald (2001) utilized regression analyses to identify six significant predictors of risky sexual practices. These included the number of partners in last six months, religious values, condom attitudes, age at first sex, bingeing on alcohol, and residential locus (Langer et al., 2001). Additionally, their literature review identified nine risk factors, which have been shown to be significantly correlated with risky sexual attitudes and behaviors which included age (sexual practices increase as adolescents get older), gender (males engage in sexual behaviors at an earlier age than do females), race/ethnicity (ethnic minorities tend to



engage in more risky sexual practices than do non-Hispanic whites), age of first sex, number of sex partners, age of first alcohol use, bingeing on alcohol (defined as having four or more drinks on a single occasion), and self-esteem (low self-esteem has been found to correlate with risky sexual behaviors; Langer et al., 2001). In a separate study, Vicary, Klingaman, and Harkness (1995) examined the prevalence of unwanted sexual activity and risk factors associated with unwanted sexual activity in young adolescents, over a four-year period. “Unwanted sexual activity” in this study was defined as having been pressured or forced into having unwanted sexual experiences (i.e. without consent), including any experiences as a young child, and ranging from being touched, completing a sexual act other than sexual intercourse, and having sexual intercourse (Vicary et al., 1995). They found that earlier age of menarche, earlier age of sexual activity, more sexually active same-sex friends, poorer peer relationships, and poorer emotional status were significant predictors for unwanted sexual activity (Vicary et al., 1995). These researchers classified risk factors for unwanted sexual activity as (1) familial, (2) pubertal timing, dating behaviors, and previous sexual activity, (3) peer relations and activities, and (4) emotional/psychological status (Vicary et al., 1995). Familial factors include being alienated from one’s family and not being well supervised (Vicary et al., 1995). These and others are among the risk factors examined in this study. After a thorough examination of the literature, individual and environmental risk factors nested in “systems” of influence for risky sexual behaviors are discussed in order to help the reader conceptualize the factors that place a teen at-risk for risky sexual behaviors.

Little research has been conducted in support of delineating the processes through which specific risk factors exert their influence (Hunter, Figueredo, Malamuth, & Becker,

2004). Kotchick, Shaffer, Forehand, and Miller (2001) report that little attention has been given to potential mediational, moderational, and nonlinear relationships among variables and systems of influence found to be related to sexual outcomes and that previous research efforts do not adequately capture the complexity associated with the adolescent sexual experience (Kotchick et al., 2001). Although it may not be possible to capture the complexity involved with adolescent sexual behaviors, a multi-systems perspective seems the best route for doing so, which is why it is employed in this study.

In short, the current study seeks to demonstrate that adolescent attitudes toward sexual/relationship issues significantly impact sexual behavior outcomes. This hypothesis will be tested with structural equation modeling (SEM) to compare three models, using goodness-of-fit statistics. The first model demonstrates the direct path between individual/environmental risk factors and high-risk sexual behaviors. The second model demonstrates the direct path between sexual/relationship attitudes and high-risk sexual behaviors. The third model demonstrates the indirect path between individual/environmental risk factors and high-risk sexual behaviors, with relationship/sexual attitudes as a mediating variable. It is proposed that SEM and mediational testing will demonstrate that the third model will be the best fit of the three models to the collected data. More specifically, it is hypothesized that relationship attitudes are a significant mediating variable between environmental risk factors and risky sexual behaviors. Mediational testing is appropriate for this hypothesis as mediation denotes the ability of a mediating variable to explain the relation between two other related variables (Baron & Kenny, 1986). Moreover, mediation indicates that an initial variable (usually intervention) causes a change in an outcome variable (such as condom

use) by exerting influence through various mediating variables (e.g. attitudes toward condom use; Salazar et al., 2005). Baron and Kenny (1986) define a mediating variable as meeting the following conditions: 1) variations in levels of the independent variable significantly account for variations in the presumed mediator; 2) variations in the mediator significantly account for variations in the dependent variable; and 3) when both these pathways are partialled out, a previously significant relation between the independent and dependent variables is no longer significant. Because of the complexity of sexual behaviors, several causes of the outcomes are present; therefore, reducing the relationship between the independent and dependent variables to zero is unrealistic, but reducing it significantly can demonstrate mediating effects. Applied to the current study, it is believed that mediation indicates that individual/environmental risk factors cause a change in high-risk sexual behaviors by exerting influence through sexual/relationship attitudes.

## CHAPTER TWO: REVIEW OF THE LITERATURE

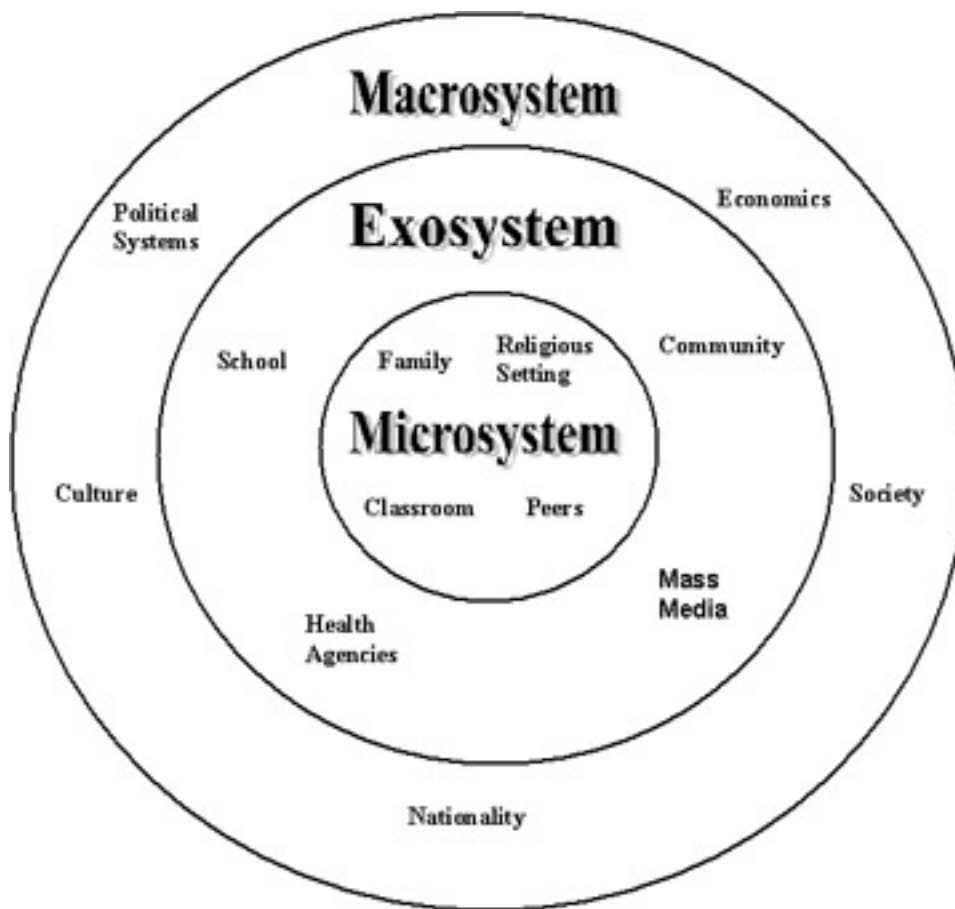
The goal of this study is to determine the mediating effects of attitude between environmental/individual risk factors and risky sexual behaviors. Given this goal, the following literature will be reviewed in order to provide a context and rationale for this study: (a) risky sexual behavior as a construct; (b) prevalence and consequences of adolescent sexual behavior; (c) adolescent decision-making; (d) sexual behavior attitudes; (e) Bronfenbrenner's (1977, 1979) ecological systems model; (f) Jessor's (1975) problem-behavior theory; (g) individual, family, extrafamilial, neighborhood, and societal variables related to risky sexual behaviors; and (h) self-report issues.

Adolescent behavior is complex and parents, teachers, and researchers alike are working toward understanding this complicated stage of development. As evidence of the availability of information on this topic, a simple search on Google for "adolescent behavior" revealed more than 2 million websites. In general, adolescence is a time of many physical, emotional, and behavioral changes. Teens' bodies mature physically and resemble more adult-like figures. Hormones and intense emotions accompany these physical changes—all the while, most adolescents are gaining independence from parents, making decisions about who they want to be and what they believe in, and having access to money and a driver's license. Today's teens also must sort through an onslaught of information from various technological sources, many of which include sexual suggestions.

### *Theoretical Basis: Bronfenbrenner's Ecological Systems Theory*

As previously noted, the influence of various environmental factors on the developing adolescent impacts whether that teen engages in risky sexual behaviors. Urie Bronfenbrenner's (1977, 1979) ecological systems theory changed the way researchers view interactions between individuals and systems and is an appropriate theoretical guide for the current study. In Bronfenbrenner's seminal work, *The Ecology of Human Development* (1979), he identified four systems levels: the microsystem, mesosystem, exosystem, and the macrosystem, which interact multi-directionally (see Figure 1).

*Figure 1.* Bronfenbrenner's Ecological Model



The microsystem includes the roles and characteristics of a developing individual (Bronfenbrenner, 1977, 1979). The mesosystem includes the social systems within which the developing person interacts (Bronfenbrenner, 1977, 1979). The exosystem entails the settings with which the individual does not interact directly, but that nonetheless have an effect on the individual's development, and the macrosystem includes the cultural values and variables that affect individuals (Bronfenbrenner, 1977, 1979). Bronfenbrenner's (1977, 1979) model is not so much concerned with human development, but with the contexts in which development takes place. He implies that development is most influenced from the outside to the inside; that is, influence is most salient from the major culture through the exosystem and mesosystem, to the microsystem, otherwise known as the developing person. Bronfenbrenner (1977) advocates that in ecological research, the principal main effects are likely to be interactions between systems. He states that the most challenging requirement of a research model for investigating the ecology of human development is that the environmental structures, and the processes taking place within and between them, must be viewed as interdependent and must be analyzed in systems terms (Bronfenbrenner, 1977). The design of an ecological experiment involving the same person in more than one setting should take into account the possible subsystems and associated higher order effects that exist, or could exist, across settings. Since almost every developmental transition, such as entering school, pregnancy, or puberty, involves more than one setting, reciprocal processes occur not only within but also across setting boundaries thus involving interaction effects at the level of higher order systems (Bronfenbrenner, 1977, 1979). The complexity of adolescent sexual behaviors could not

be adequately explained solely in the context of the individual's development; therefore, the systems approach seems the most appropriate for detailing the various spheres of influence on sexual behaviors. The systems approach has been employed in the current study because it provides frameworks for (a) understanding the nature of the social context, (b) understanding the individual in context, and (c) designing interventions that focus on individual-setting transactions rather than only on the individual (Trickett and Zlotlow, 1990).

Evidence of the validity of ecological systems theory is abundant. For instance, Turbin and colleagues (2006) investigated the degree of influence of individual versus social factors on adolescent health behavior of U.S and Chinese teens. Results indicate that social context protective and risk factors accounted for more unique variance than did individual-level protective and risk factors (Turbin et al., 2006). A similar study utilized a multi-systemic theoretical framework to examine protective and risk factors of adolescent life; specifically, they examined the influence of family, peers, school, and neighborhood in both Chinese and American teens (Costa et al., 2005), finding that family and peer contexts were the most influential in the U.S. sample, while peer and school contexts were the most influential in the Chinese sample. Likewise, a dissertation study by Beitz (1995) examined the influence of the effects of independent variables versus the effect of variables taken together to explain variance in sex behaviors. Beitz (1995) found that examination of the independent variables of formal sex education, parent-adolescent communication, and religiosity were significant, but weakly related to sex attitudes; however, simple multiple regression demonstrated that the variables taken together explained the negligible variance in sex behaviors. Butler's (2003) findings also

underscore the importance of social contexts for sexual behavior attitudes and decision-making.

A meta-analysis conducted by the World Health Organization utilized an ecological systems approach when examining the literature of risk and protective factors linked to sexual behavior outcomes in developing countries outside the United States (Blum & Mmari, 2005). The majority of risk and protective factors for sexual outcomes are similar to those found in U.S. studies at different system levels (see Figure 2.) These similarities imply that for the most part, teens around the world (in developing countries) are impacted by the same factors when making decisions regarding sexual behaviors. Therefore, generalizing this type of research to other developing countries may be appropriate.

Several researchers have adopted Bronfenbrenner's (1979) ecological systems theory to provide a multisystemic perspective on adolescent risk behavior, some focusing specifically on adolescent sexual behaviors. Jessor's (1991) "web of causation" for risky behaviors in adolescence has proposed interweaving factors associated with adolescent sexual activity into a multisystemic framework comprised of self, family, and extrafamilial systems. Melding ecological systems theory with the research on risky sexual behaviors, we find numerous variables common to the microsystem and mesosystem levels, such as early age of menarche, family influences, and peer pressure; however, risk factors for sexual behaviors at the exosystem level, such as media influences, and at the macrosystem level, such as cultural norms, are less prevalent. Exosystem variables would be considered factors that have an influence on the individual, but with which the individual does not directly interact (i.e. parents'



employer, school board, etc). In their review, Kotchick and her colleagues (2001) examined the literature on adolescent sexual risk behavior from a multisystemic perspective. Their review examined the reciprocal relations among multiple systems of influence on a person's behavior (Kotchick et al., 2001). Based on their findings, they propose that an accurate and comprehensive understanding of adolescent sexual risk behavior must include knowledge of how the personal and environmental factors impact teens' decisions to engage in risk-promoting or risk-reducing sexual behaviors (Kotchick et al., 2001). For example, a teen's decision to invite someone over to engage in sexual activity involves more than the teen's individual characteristics (e.g. desire). Such a decision also includes the presence of parents and how such a decision might affect peer perceptions.

Corcoran, Franklin, and Bennett (2000) also conducted a study utilizing the ecological systems theoretical model. Corcoran et al. (2000) compared nonpregnant and nonparenting teens with pregnant/parenting teens, by factors that were organized around three systems of interacting categories of variables. Factors in their model included self-esteem, depression, and stress (microsystem); family structure, family functioning, and problems with friends, neighborhood, and school (mesosystem); and household income, parents' occupations and race (macrosystem). Their final model included factors aligned with Bronfenbrenner's (1977, 1979) macro-, meso-, and microsystem levels (Corcoran et al., 2000). Another study used Bronfenbrenner's multi-systemic framework to determine the factors predicting scores on the McMaster Family Assessment Device with a sample of low SES and culturally diverse teenagers (Corcoran, 2001). Corcoran (2001) identified the teenagers themselves at the individual (microsystem) level, the immediate

social environment at the mesosystem level, and family structure, SES, and race at the macrosystem level. Support for a model including all three levels influencing family functioning was found (Corcoran, 2001). Similarly, Woodward, Fergusson, and Horwood (2001) examined data from a 20-year longitudinal study of 533 New Zealand women to examine the extent to which the risk of an early pregnancy was related to a range of social background, family, individual, and peer relationship factors measured over the course of childhood and adolescence. Results of their multi-systemic analysis led to a profile of those at greatest risk of teenage pregnancy (under 20 years) as that of an early-maturing girl with conduct problems who had been reared in a family environment characterized by parental instability and maternal role models of young single motherhood (Woodward et al., 2001). Utilizing the ecological systems theoretical perspective, the current study will explore the systems of influence on risky sexual behavior outcomes, which will be described in detail in the following sections.

### *Risky Sexual Behavior*

In his dictionary of epidemiology, Last (1988) defined risk as the probability that an event will occur, e.g., that an individual will become ill or die within a stated period of time or age. Risk was also defined as a non-technical term encompassing a variety of measures of the probability of a (generally) unfavorable outcome (Last, 1988). Kirby (2002) labeled factors as risky if those factors increase the likelihood of negative health behaviors and outcomes, or discourage positive behaviors that might prevent negative health problems. In more simplified terms, Wilder & Watt (2002) defined risky behaviors as those that jeopardize one's physical well-being. Last's (1988) reference to risk as a person's chances that she might die is a bit more serious than the typical outcomes of

risky sexual behaviors, which most often include nonfatal sexually transmitted diseases and pregnancy. Jessor's (1991) definition of a risk factor seems more aligned with sexual behavior outcomes. According to Jessor (1991), a risk factor can be defined as agents or conditions that are associated with an increased probability of outcomes that compromise health, quality of life, or life itself. He uses the term "risk behavior" to refer to any behavior that can compromise the psychosocial aspects of successful adolescent development (Jessor, 1991).

Specifying risky behaviors in the sexual domain, one study identified risky sexual behaviors as sex under the influence of alcohol or drugs as well as sexual coercion (Gowen, Felman, Diaz, & Yisrael, 2004). Kotchick et al.'s (2001) definition of adolescent sexual risk behavior includes the inconsistent or non-use of condoms or other contraceptive methods, having multiple sex partners, and the use of alcohol or drugs prior to or during sexual activity. Kotchick and colleagues (2001) chose these behaviors to represent risky sexual behaviors because they are all well represented among the outcomes in the adolescent sexual behavior literature. Cooper, Wood, Orcutt, and Albino (2003) identified risky sexual behavior by measuring 1) the number of lifetime sexual partners; 2) a count of the number of risky sexual practices in which the respondent had ever engaged; and 3) a count of two adverse outcomes associated with sexual risk taking (having ever had an STD and/or having ever had a pregnancy or "pregnancy scare.") Similarly, Levine and Coupey (2003) examined risky sexual behaviors by operationalizing such behaviors as ever having sexual intercourse, current sexual activity, number of lifetime partners and number of pregnancies, use of alcohol and other drugs at last intercourse, and use of condoms at last intercourse. Shrier, Harris, Sternber, &

Beardslee (2001) used comparable measures to define sexual risky behaviors, such as not using a condom at last sexual intercourse and having had one or more sexually transmitted diseases. Other researchers have defined risk factors for sex-related behaviors as characteristics, conditions, attitudes, and behaviors which significantly increase the possibilities of experiencing undesirable outcomes related to sexual activities, such as having multiple partners, unprotected sex, and sex while intoxicated or high (Langer, et al., 2001). Based on this information, risky sexual behaviors have been defined for this study as high frequency of sexual partners, low frequency of contraception use, having had an STD or pregnancy, and early age of first sexual experience (consensual).

Because the long-term objective of the current study is to provide information for more effective intervention/prevention efforts of risky sexual behaviors, understanding how risk factors relate to prevention and intervention is important. When measuring risk behaviors for intervention design, Jessor (1991) recommends that risk be conceptualized in terms of the degree of risk associated with the engagement in risk behavior. In other words, what is the risk that such engagement will compromise adolescent health, life, or success? In order to assess the degree of risk, clinicians and researchers need to account for the intensity of involvement in any particular risk behavior (i.e. exploration versus serious habit), the number of risk behaviors in which the teen is involved, timing of age of onset of the risk behaviors, and the degree of protective factors present (i.e. characteristics or conditions present which buffer against development of adverse outcomes, such as bonding to family; National Center for Children Exposed to Violence,

2006). When risk behaviors are not managed well, adolescents must live with the consequences. Based on current prevalence rates, they need help.

### *Jessor's Problem Behavior Theory*

Before describing the interaction of teens' systems, the interactions of teens' behaviors require attention. Of importance is the finding that adolescents at highest risk for negative sexual outcomes are those who are involved in many risk acts, such as substance use and/or delinquency, not just sexual risk acts (Rotheram-Borus, Rosario, Reid, & Koopman, 1995). This is a pattern that has been found repeatedly in the literature. Many of the studies reviewed not only found risky sexual behaviors and delinquency to be related, but also noted relationships between most adolescent risk-taking behaviors. Jessor (1991) has extensively studied the possibility that an underlying construct of problem behaviors exists, thus tying adolescent risk-taking behaviors together. Jessor (1991) states that "overall, the empirical evidence supports the existence of organized patterns of adolescent risk behaviors" (p. 600). Although the primary concern of Jessor's (1991) work has been providing an account of risk behavior (therefore, a top-to-bottom emphasis), engaging in risk behavior can also affect the various domains of risk factors (a bottom-to-top influence). Due to the covariation among risk behaviors, it makes more sense to direct our attention to the adolescent's lifestyle rather than to each of the risk behaviors. Jessor's approach is aligned with Bronfenbrenner's (1977, 1979) ecological systems theory because it advocates for the researcher to explore the adolescent as an individual system (microsystem), nested within other systems of influence, rather than a series of characteristics or behaviors. Jessor's problem behavior theory also has implications for intervention. The existence of this

problem behavior construct raises the question about where interventions should be focused, on specific risk factors or on lifestyle choices. Lifestyle change is an intervention challenge and doing so is likely to result in a more enduring impact on the repertoire of risk behaviors.

Several studies, some of which have already been noted, have approached risk-taking behaviors as a behavior pattern. For example, Cooper, Wood, Orcutt, and Albino (2003) examined longitudinal data from nearly 2000 teens to determine the role of personality in multiple risk or problem behaviors. Results from their study indicate that covariation among diverse risky behaviors (i.e. underachievement, delinquency, etc) can be adequately modeled by a single higher order factor. Fergusson and Woodward (2000) have found evidence of a causal chain process in which early adolescent conduct problems were associated with a series of adolescent risk-taking behaviors, including early-onset sexual behavior. Wilder and Watt's (2002) analysis of data from the National Longitudinal Study of Adolescent Health (Add Health) found that adolescents who engaged in risky behaviors were especially likely to have had sex.

How early do environmental factors influence problematic behaviors? Carlson and colleagues (2005) explored behavioral risk and protective factors in preschoolers attending Head Start. The presence of several risk factors was found to be related to behavioral concerns of the preschoolers (Carlson et al., 2005). For example, preschoolers having risk factors such as single parent households, parents with a high school degree as opposed to a college education, or being male were significantly related to demonstrating behavioral concerns (Carlson et al., 2005). As a co-founder of Head Start,

Bronfenbrenner would agree that prevention efforts at various systems levels at early ages are the most effective approach for reducing negative behaviors and outcomes.

### *Prevalence and Consequences of Adolescent Sexual Behaviors*

Statistics related to teenage sexual behaviors are staggering and disconcerting. One of the first concerns is the increasing proportion of adolescents having sex at an early age. American adolescents are engaging in sexual intercourse at younger ages than ever as demonstrated through national level data collections finding that approximately 18 to 19% of adolescents have engaged in sexual intercourse before age 15 (Albert, Brown, & Flanigan, 2003; Kirby, 1997; Terry & Manlove, 2000). More currently, the National Youth Risk Behavior Survey (Centers for Disease Control and Prevention (CDC), 2006) estimates that 4.4% of adolescents have had sexual intercourse before age 13. This trend has been documented over the past two decades in several industrialized countries (CDC, 2004b). Early sexual debut is related to multiple aspects of high-risk sexual behaviors, including inconsistent condom use, pregnancy, and a greater number of sexual partners (McGuire III, Shega, Nicholls, Deese, & Landefeld, 1992; Smith, 1997). Early sexual debut has also been associated with greater risk of infection because of added opportunities for more sexual encounters, multiple partners, and high-risk partners (Blum & Mmari, 2005; Koyle, Jensen, Olsen, & Cundick, 1989; Miller, 1998). In addition, early onset of sexual activity has been associated with lower religiosity, accepting attitudes toward deviance, and actual involvement in deviant or problem behaviors such as delinquency and substance use (Costa, Jessor, Donovan & Fortenberry, 1995; Donovan & Jessor, 1985). These same researchers observed that early sexual debut is associated with involvement in drug and alcohol consumption (Jessor, Costa,

Jessor, & Donovan, 1983). These findings suggest that early onset of sexual intercourse is grounded in a general propensity to engage in risky behavior. Jessor (1991) hypothesized that a unifying construct of risky behaviors exists (Jessor's problem-behavior theory) and the relevance to the current study will be discussed in this section.

Current prevalence of adolescent sexual behaviors, on a national level, were identified in the Youth Risk Behavior Survey (YRBS; CDC, 2004b, 2006). The YRBS monitors priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among youth and adults in the United States (U.S.; CDC, 2004b, 2006). The national YRBS is conducted every two years during the spring semester and provides data representative of 9<sup>th</sup> through 12<sup>th</sup> grade students in public and private schools throughout the U.S. (CDC, 2006). Many trends noted in the survey indicate that youth are moving toward healthier choices; however, some of these changes are of fairly small magnitude and all of the noted behaviors continue to be at concerning levels of prevalence. Of the 2005 population surveyed, 33.9% of both male and female students identified themselves as currently sexually active, defined as having had sexual intercourse during the three months preceding the survey (CDC, 2006). Approximately 47% of students indicated that they have ever had sexual intercourse and 63% of currently sexually active students used a condom during their last sexual intercourse—a finding that has increased almost 20% since 1991 (CDC, 2006). The reported use of oral contraception is lower with only 17% of currently sexually active students taking a birth control pill before their last sexual intercourse, down 3% since 1991 (CDC, 2006). There was a decrease in the number of high school students who reported having four or more sex partners; 14% in 2003 as compared to 19% in 1991 (CDC, 2006). Substance use



before sexual intercourse has slightly increased from 21% in 1991 to 23.3% in 2005 (CDC, 2006). An interesting comparison is that surveyed students were more likely to wear their seat belts (90%) than to use condoms (63%; CDC, 2004b).

Prevalence rates reveal high percentages of teens engaging in sexual behavior and one health consequence of these actions is the contraction of disease. Adolescents are the population at highest risk for acquiring sexually transmitted diseases, with risk factors that include having multiple sex partners, engaging in unprotected sex, and having partners who are at high risk for having an STD (Division of STD Prevention, 2000; Eng & Butler, 1997). Teenagers account for 25% of new sexually transmitted diseases reported annually and every 14 months, the number of HIV-infected adolescents doubles (CDC, 2000). Another study indicated that among sexually active teens, 12.8% reported having had an STD, 48.9% reported using drugs and alcohol while having sex, 42.6% indicated they had sex with a high-risk partner, and 55.3% said they had sex without a condom (Donenberg, Emerson, Bryant, Wilson & Weber-Shifrin, 2001). The World Health Organization estimates that 1 in 20 adolescents worldwide acquire a sexually transmitted disease each year (Blum & Mmari, 2005). Although condoms are made available free of charge in many health clinics, many findings indicate that only approximately 10 to 20% of sexually active adolescents use condoms consistently (DiClemente, 1992; Kann, et al., 1995). This leads us to believe that availability of contraception is not the main barrier in safe sex practices. Additionally, previously having a sexually transmitted disease has been linked to having other sexually transmitted diseases (Blum & Mmari, 2005). The nature of teens' romantic relationships also contributes to their risk. Unlike adult relationships, Overby and Kegeles (1994) note that

adolescent relationships are typified by engagement in sexual activities through serial monogamous sexual relationships that are of short duration. This factor increases adolescents' exposure to multiple sexual partners and the associated risks.

In addition to the contraction of disease, teenage pregnancy remains a societal concern. Ten percent of all young women aged 15 to 19 years in the United States become pregnant each year (Alan Guttmacher Institute, 1999). Young women's bodies have a higher risk of antenatal complications and mortality for the baby (Black & DeBlassie, 1985). Adolescent girls who become pregnant are not the only ones affected by their conception of a child. Studies have found that pregnant teens have an increased likelihood of an early marriage and subsequent marital breakdown (Furstenberg, Brooks-Gunn, & Morgan, 1987) and demonstrate less competent parenting (Brooks-Gunn & Chase-Lansdale, 1995; Nagin, Pogarsky & Farrington, 1997). Teenage pregnancies result in social and health concerns that affect all of society and often have long-term effects on the family. For example, Ladner's (1987) literature review found research that shows over 50% of teen mothers drop out of school specifically due to pregnancy; a finding also noted by Upchurch and McCarthy (1990). Therefore, a major social concern resulting for adolescent pregnancy is the loss of educational attainment opportunities, which in turn often leads to socioeconomic disadvantage and welfare dependence (Black & DeBlassie, 1985; Furstenberg, et al., 1987). In other words, society "pays" for teens' loss of work productivity. Maynard (1997) notes that each year the federal government spends approximately \$7 billion to help families that began with a teenage birth. Children of teenage mothers are also at a notable disadvantage. These children suffer higher rates of low birth weight and related health problems (Martin et al., 2002), often have

insufficient health care (Maynard, 1996), and are more likely to receive inadequate parenting (Maynard, 1996). Children of teenagers also often suffer from poor school performance. Children of teens are 50 percent more likely to repeat a grade, perform worse on standardized tests, and are less likely to complete high school than if their mothers had delayed childbearing (National Campaign to Prevent Teen Pregnancy, 1997). Additionally, rates of foster care placement are significantly higher for children whose mothers are under age 18 and over half of foster care placements of children with teenage mothers could be averted by delaying childbearing, saving nearly \$1 billion annually in foster care costs (Maynard, 1996). Although the negative consequences of adolescent sexual behaviors are many, numerous teens choose to refrain from engaging in risky behaviors, such as unsafe sex. Understanding how teens decide whether to engage in risky behaviors is important.

### *Adolescent Decision Making*

The reasons why adolescents choose risky behaviors must be explored; however, the literature regarding adolescent decision-making is inconclusive. No doubt, benefits to the adolescent must be acknowledged. Smoking, drinking, illicit drug use, risky driving, and/or early sexual activity can be instrumental in gaining peer acceptance and respect; in establishing autonomy from parents; in repudiating the norms and values of conventional authority; in coping with anxiety, frustration, and anticipation of failure; and in affirming maturation and marking a transition out of childhood and toward a more adult status (Jessor, 1991). Several studies have found that teens possess the cognitive abilities to make rational decisions (Harris, et al., 2002; Jacobs & Klaczynski, 2002; Reyna & Farley, 2006); however, whether teens have the cognitive abilities to make rational

decisions is not as important as whether they chose to use those abilities. Some may argue that adolescents are not cognitively mature enough to associate their attitudes with behaviors, or to use this association, in order to make informed decisions. Harris et al. (2002) would disagree stating, “adolescents possess the cognitive abilities to formulate rational behavioral intentions based on perceived attitudes about the risk and benefits associated with engaging in such behavior” (p.1010).

Jacobs and Klaczynski (2002) note that adolescents develop biased judgment strategies that are used inappropriately in some situations. Similarly, Reyna (2004) argues that adolescents possess a bias in overestimation of reduction of sexual risk with certain behaviors; therefore, some teens may think they are engaging in safe sex behaviors, when, according to adult standards, they are not. Reyna and Farley (2006) add that many teens perceive risk to be high in risky situations, but believe that the consequences would “not be that bad” (p. 6). They also reported that, when directly compared, perceived benefits predict risk-taking behavior and often carry more weight than perceived risks (Reyna & Farley, 2006). It could also be argued that, because adolescents’ goals are more likely to maximize immediate pleasure, decisions to engage in some unhealthy behaviors (i.e. drug use or sexual activity) could be deemed “rational” (Reyna & Farley, 2006). Additionally a substantial amount of adolescent risk taking is spontaneous, reactive, and impulsive (Reyna & Farley, 2006). The immediacy of these decisions should not be overlooked in teens’ decision-making processes.

Butler (2003) underscored the importance of social contexts for adolescents’ decisions to engage in sexual activity and to use safer sex methods. A qualitative study investigating factors that impact sexual behavior decision-making resulted in a model,

which included contextual factors (relationship and personal characteristics), consideration of risks and benefits, boundary communication, and later evaluation of the event (Michels, Kropp, Eyre, & Halpern-Felsher, 2005). Participants in this study reported health and social risks as considerations for engaging in sexual activities and many portrayed themselves as active decision makers, weighing the risks and benefits of each sexual situation (Michels, et al., 2005). Reyna and Farley (2006) suggest that interventions designed to discourage teens from deliberately weighing risks and benefits may ultimately prove more effective and enduring, because mature adults who resist risks do not do so out of deliberation, but because they “intuitively grasp the gists of risky situations and retrieve appropriate risk-avoidant values” (p.2). But how do “risk avoidance values” develop? Exploration of attitudes regarding sexual behaviors provides some insight.

#### *Attitudes Related to Sexual Behavior*

Cognitive processes are influential determinants of sexual practices. While health educators may have little or no control over some of the factors that shape sexual behaviors, they can influence attitudes in a number of areas. Examining attitudes is not a new perspective in the field of psychology. Lonsway and Fitzgerald (1994) note that rape prevention education has focused almost entirely on attitude change as an outcome. Similarly, Brecklin and Forde (2001) explain that the most common dependent measures used in rape prevention/education program evaluations are scales measuring attitudes toward rape. Cognitive distortions is a term used in the rape prevention literature, often referred to as rape myths, which are false but widely held beliefs that excuse sexually aggressive behavior (Burt, 1980; Lonsway & Fitzgerald, 1994). Rape myth acceptance

has consistently been found to be associated with sexually aggressive behavior in community and college samples (Lonsway & Fitzgerald, 1994). Cognitive distortions regarding risky sexual behaviors may do the same. For example, a 15 year-old female might think, “I am mature if I have sex,” which may lead her to perform riskier sexual behaviors than if she did not have this distortion or belief. Attitudes that emphasize the positives of sexual intercourse or deemphasize possible negative outcomes should indicate a quantity-based reproductive strategy. “Pro-sex” attitudes encourage early adolescent intercourse (McLaughlin, Chen, Greenberger, & Biermeier, 1997). With regard to sexual beliefs, girls with older boyfriends endorsed beliefs that guys are sexually proactive, that sex is related to maturity, and sex just happens (Gowen et al., 2004). These beliefs attribute control to outside sources, rather than to the female adolescent, thus increasing the likelihood that she will be involved in risky sexual behaviors because she feels such actions are beyond her control. On the other hand, the theory of reasoned action states that protective behaviors are contingent on positive attitudes about a behavior and on social norms favoring it, while the theory of planned behavior takes into account perceptions that the behavior is easy (Ajzen & Fishbein, 2005). From this we can infer that positive attitudes about safe sex practices, societal acceptance of safe sex practices, and the teen’s perception that demonstrating safe sex behaviors are easy, are more likely to lead to behavior change. A meta-analysis examining the validity of various theoretic assumptions about cognitive and behavioral change regarding condom use found that the influence of persuasive arguments designed to induce attitudes, norms, perceived control, and behavioral skills were likely to increase condom use (Albarracin et al., 2003). Perhaps this approach would suit sexual activity

prevention efforts as well. Several researchers have documented the finding that adolescent attitudes toward risk-reduction strategies, like condom use, are associated with their use. It has been found that adolescents with more positive attitudes toward condoms tend to report greater use of condoms (Blum & Mmari, 2005; DiClemente, 1992; Jemmott & Jemmott, 1990), as well as other contraception methods (Blum & Mmari, 2005). Conversely, four out of five studies in a meta-analysis showed that when adolescents perceive barriers to using condoms, they are less likely to use them (Blum & Mmari, 2005). Indeed, Blum and Mmari's (2005) meta-analysis revealed that while reproductive health knowledge may not be as important in influencing adolescent behaviors, attitudes toward sex is clearly an important factor for predicting adolescent sexuality. They reported that out of the eight studies that analyzed the relationship between sexual experience and attitudes to sex, all eight found that having more permissive attitudes toward sex greatly increased the risk for adolescents to have had sex (Blum & Mmari, 2005). Numerous cognitive factors that mediate the use of safer sex behaviors have been identified in the literature. Some theoretical mediating variables include intentions to use condoms, self-efficacy of condom use, and self-efficacy of condom negotiation and safer sex behaviors among adolescents and young adults (Bandura, 1989; DiClemente, 1991; Fishbein et al., 2001; Santelli, DiClemente, Miller, & Kirby, 1999).

Another study noted the lack of female interracial patterns in attitudinal research related to sexual values. Howard (1988) interviewed nearly a thousand adolescents and found that responses of African American and Caucasian adolescents were much more similar than they were different, suggesting that there are neither innate nor cultural

differences between these two racial groups in their underlying systems of values or attitudes toward sexuality.

There are some underlying assumptions when attitudes are measured in hopes of finding more effective interventions. It is assumed that education can change attitude and that attitude change will then lead to behavior change. It is not known whether education and attitude change will lead to behavior change of risky sexual behaviors; however, with rape and violence intervention programs, this has been found to be true. For example, in a study similar to the current one, O'Keefe (1997) suggested that youth exposed to domestic violence, who in turn perpetrate dating violence, can be differentiated from similarly exposed, but nonviolent peers on the basis of attitudes reflecting acceptance of violence in dating relationships, low self-esteem, and additional exposure to community and school violence. Similarly, Heppner, Humphrey, and Hillenbrand-Gunn (1995) measured rape-myth acceptance and rape prevention attitudes among college students and found significant levels of change following an interactive drama and didactic-video intervention. It should be noted that Heppner et al. (1995) identified a rebound effect in attitudes and recommend prevention programming to include short-term interventions at more frequent intervals to maintain the healthier attitude. Heppner et al.'s (1995) review of the rape prevention literature notes that studies that focused on changing attitudes about rape were more often than not, without any guiding theoretical framework. Based on this information, interventions focusing on attitude change, guided by empirically supported theory, should include follow-up work to lengthen treatment effects.



### *The Microsystem: Individual Variables*

According to Kotchick et al. (2001) the self-system, or microsystem, refers to a constellation of factors, including qualities, skills, knowledge, attitudes, and behaviors, that belong to an individual person and which have either a direct or indirect influence on behavior. The microsystem, for a troubled adolescent, may include the adolescent as she interacts with family, special education programs, a correctional institution, or peer-dominated contexts of a formal or informal nature (Kotchick et al., 2001). When examining an individual within different systems, a mindful researcher considers the individual's presence in various social contexts. The process of going from one microsystem to another is described as an ecological transition, with emphasis on the individual's interactions across social contexts, which may provide the individual with quite contrasting microsystem ecologies (Kotchick et al., 2001). In the context of risky sexual behaviors, an adolescent's individual risk factors include biological, psychological, cognitive/emotional, and behavioral factors.

*Biological factors: Age & age of menarche.* Common sense dictates that older adolescents report more sexual activity and having more partners than younger teens (Miller, Forehand, & Kotchick, 2000); therefore, being an older teen is a risk factor for risky sexual behaviors, as compared to younger teens. In a review of 44 studies, Blum and Mmari (2005) found that the likelihood of experiencing first sex greatly increased by the age of the respondent. The same is true for age and the number of sexual partners, as well as age and the contraction of sexually transmitted diseases (Blum & Mmari, 2005). The timing of first intercourse may be a useful marker for risky sexual behavior and a history of sexually transmitted diseases (Greenberg, Magder, and Aral, 1992). Of interest

is that the international research (in developing countries) shows that adolescents who have sex at older ages, and those who began having sex at older ages, were more likely to use condoms and other forms of contraception (Blum & Mmari, 2005). Therefore, delay of initial intercourse appears to be a protective factor for condom use. Additionally, age is likely a marker for many other factors, such as impulsivity and puberty, which influence sexual behaviors as well. In the current study, participants' ages were included in the analysis.

Multiple studies have demonstrated significant, positive associations between earlier pubertal timing and earlier transition to first sex, as compared to peers (Blum & Mmari, 2005; Flannery, Rowe, & Gulley, 1993; Magnusson, 2001; Udry, 1979; Udry & Billy, 1987). Early pubertal development has been found to relate to earlier ages of sexual debut for both males and females of minority and non-minority races (Miller, Norton, Fan, & Christopherson, 1998). This link has also been found in the international literature. For example, in Kenya, attaining puberty was associated with tripling the likelihood of female sexual activity (Kiragu & Zabin, 1993). A study by Mezzich et al. (1997) examined the effect of early pubertal timing (i.e. age of menarche) on adolescent sexual risk behavior and found that age at menarche was strongly correlated with affiliation with an adult boyfriend (over age 18) and risky sexual behavior. Examining age of menarche from a genetic framework, Hunt (2002) used genetic markers as direct predictors of pubertal maturation and subsequent onset of sexual behavior in adolescents, using the androgen receptor and the cytochrome P450c17-a genes. Hunt (2002) found that later ages of menarche, as measured genetically, predicted lower onset level of sexual development; while earlier ages at menarche predicted higher onset levels of

sexual development. She advocates that genetic markers can be used to help identify variation in timing of pubertal development and identifying at-risk teens (Hunt, 2002). It is theorized that early developing girls who look more mature will be more likely to be perceived by others, and to see themselves, as attractive and appropriate romantic/sexual partners, opening doors to dating and sexual activity (Brown, Halpern, & L'Engle, 2005). For the purposes of this study, age of menarche was included as a demographic question.

*Psychological factor: Impulsivity.* Impulsivity has been linked to precocious or indiscriminate sexual behavior (Rosenthal, Muran, Tolley, Peeler, & Pitts, 1992), and as such is explored as a risk factor in the current study. It has been hypothesized that some teens may have an underlying predisposition toward sensation seeking, risk taking, or impulsivity that results in teens engaging in substance use and riskier sexual practices (Deas-Nesmith, Brady, White, & Campbell, 1999). Kovacs, Krol, and Voti (1994) also hypothesized that the link between problem behaviors and teenage pregnancy can be found in impulsivity, or the general tendency to act without planning or forethought. Impulsivity has been defined as including both the tendency to give into urges, impulses, or desires, and to respond to stimuli impetuously, without reflection or planning (Revelle, 1987). Adolescents' sexual behavior is often impulsive, spontaneous, and not the result of careful decision-making (Kirby et al., 1994). This is concerning as we know that highly impulsive individuals, when faced with a conflict between immediate positive consequences, but distal negative consequences, most often will choose the course of action which results in immediate gratification (Cooper, et al., 2003). This may be because impulsive individuals do not believe that possible future costs will be associated with their decision or they understand the future costs, but are unable to regulate their

actions. To measure impulsivity, the current study utilized the attention deficit-hyperactivity disorder (ADHD) scale of the Youth Self-Report (Achenbach, 1991).

*Behavioral factors: Substance use and delinquency.* The bulk of the literature on sexual behavior outcomes focuses on the presence of substance use and conduct disorder in the female teens exhibiting the sexual behaviors. Several links between behavioral factors and risky sexual behaviors have been documented in the literature. Some of those identified include a positive relationship between substance use and early sexual intercourse (Bentler & Newcomb, 1986), delinquency and sexual activity (Devine, Long, & Forehand, 1993), and sexual activity and poor school performance (Miller & Moore, 1990).

Adolescents who use drugs and alcohol are more likely to engage in high-risk sexual behavior (Bachanas et al., 2002; Barthlow, Horan, DiClemente, & Lanier, 1995; Elliot and Morse, 1989; Hockaday, Crase, Shelley, & Stockdale, 2000; McNair, Carter, & Williams, 1998; Morris, Baker, Valentine, & Pennisi, 1998; Paul, Fitzjohn, Herbison, & Dickson, 2000; Streetman, 1996; Udry, Kovenock, and Morris, 1996; Whitbeck, Conger, Simons, & Kao, 1993). Specifically, marijuana use has been found to be a strong predictor for risk of pregnancy (Mcgill, 2000). Literature in other developing countries reveals similar results for substance use. For example, regarding alcohol use, eight out of nine studies in a meta-analysis found that using alcohol significantly increased the odds that an adolescent had already engaged in sex and four out of seven studies found that adolescents who use drugs were much more likely to be sexually experienced than adolescents who did not use drugs (Blum & Mmari, 2005). When racial differences were examined specifically, the connection between substance abuse and risky sexual

behaviors does not seem to be race-specific (Fortenberry, 1995; Smith, 1997). Substance use appears to play a critical role in teens' risky sexual practices because the use of substances often immediately precedes the onset of sexual activity (Rosenbaum & Kandel, 1990). This is especially concerning for young women whose increased risky sexual behaviors include greater susceptibility to some sexually transmitted diseases as well as the fact that female drinkers may have lower alcohol tolerance levels than males resulting in more immediate feelings of alcohol effects (i.e. drunkenness) (Rosenbaum & Kandel, 1990).

Boyer, Tschann, and Shafer (1999) used logistic regression to predict sexual experience and linear regression to predict risky sexual behaviors in ninth grade adolescents. Results indicate that use of alcohol and drugs is associated significantly with sexual experience and sexual risk. Several studies found similar findings, indicating that teens who use marijuana and alcohol also tend to engage in more STD-related risk behaviors, including earlier initiation of sexual intercourse and inconsistent use of barrier contraceptives (Eng & Butler, 1997; Graves & Leigh, 1995; Keller et al., 1991; Lowry et al., 1994). Stueve and O'Donnell (2005) examined relations between early alcohol use and subsequent alcohol and sexual risk behaviors among urban adolescents (controlling for early sexual initiation) and found similar positive connections between substance use and risky sexual behaviors. Results indicate that by 10<sup>th</sup> grade, females who reported early alcohol use were about four times as likely as their alcohol-delaying counterparts to report being recently drunk or high and almost twice as likely to initiate sexual intercourse or engage in sexual intercourse (Stueve & O'Donnell, 2005). They conclude that prevention programs need to begin earlier than seventh grade and must address the

combined risks of early drinking and sexual experimentation (Stueve & O'Donnell, 2005).

The long-term effects of substance use on sexual behaviors can be serious. Graves and Leigh (1995) examined the connection between acquiring the human immunodeficiency virus (HIV) and substance use. Their results indicated that the presence, frequency, and quantity of substance use over time is associated with an increased likelihood of having sexual intercourse, having more than one sexual partner, and not using a condom, thus increasing one's risk for contracting HIV (Graves & Leigh, 1995). In short, it appears that alcohol/drug use can impact sexual behaviors both at the time of the sexual activity (i.e. deciding whether to engage in sexual activities under substance influence) and over long-term periods (i.e. drug/alcohol use increases one's overall engagement in risky sexual behaviors).

According to Kirby (2001), studies investigating risk behaviors of adolescents suggest two plausible interpretations of the relationship between substance use and risky sexual behavior: (1) they are all part of a general inclination to take risks and an environment that supports such behavior; and (2) drug and alcohol use diminish both inhibitions and rational decision-making, thereby increasing the likelihood of unprotected sex. As noted previously, the notion that risk behaviors cluster together is empirically supported. Because substance use is overwhelmingly supported as a risk factor for sexual behaviors, it is included as a variable in the current study and assessed through items on the Youth Self-Report-Delinquency Scale (Achenbach, 1991).

Many studies examining teenage parenting have also focused on the connection between sexual behaviors and socially deviant or delinquent acts (Abrahamse et al., 1988;

Elster, Ketterlinus, & Lamb, 1990; Ensminger, 1990). It is well established that adolescents involved in delinquency and violence are more likely to be sexually active (Reiss & Roth, 1993). This connection has been documented extensively and explained as reflecting a tendency toward social nonconformity or risk taking or an underlying dimension of behavioral dysregulation (Donovan and Jessor, 1985; Kirby, 2001). Whether guided by an underlying construct of problematic behavior patterns or some other hypothesis, it is clear that conduct problems and sexual behaviors are linked. Woodward and Fergusson (1999) examined the relationship between early conduct problems and teenage pregnancy in a birth cohort of young women participating in the study until the age of 18 years. Their study concluded that the association between early conduct problems and later risk of teenage pregnancy (after controlling for confounding factors, such as children born into single-parent families, mothers without completion of formal education, and low maternal emotional responsiveness) was largely explained by a series of intervening adolescent behavioral processes relating to early sexual risk-taking and adolescent substance abuse (Woodward and Fergusson, 1999). A subsequent study by Fergusson and Woodward (2000) examined the extent to which conduct problems at age 13 were associated with a range of educational, psychosocial, and sexual outcomes at age 18 in a birth cohort of 488 young women. They concluded that girls with high levels of conduct problems were more than three times more likely to have had at least five sexual partners and more than six times more likely to have become pregnant by the age of 18 (Fergusson & Woodward, 2000). Results also revealed that adolescent conduct problems placed girls at an increased risk of being raped or sexually assaulted during their later adolescent years (Fergusson & Woodward, 2000). They state that their

findings clearly suggest a causal chain process in which early conduct problems are associated with increased risk-taking behaviors in adolescence, with these behaviors spanning peer choices, early sexual activity, and adjustment in school (Fergusson & Woodward, 2000). Fergusson and Woodward (2000) also suggest that there is a broad spectrum of problem behaviors in adolescent girls ranging from none to severe, with risks of later adverse outcomes tending to increase with increasing levels of severity of these behaviors. Some studies have examined the influence of depression and conduct disorder on teenage sexual behaviors to determine how these two constructs relate to high-risk sexual behaviors. Kovacs and colleagues (1994) investigated whether early onset of depressive and conduct disorders, along with historical/family variables, increased the risk of teenage pregnancy. They repeatedly evaluated a sample of 83 girls during an interval of up to 12 years and found that childhood or adolescent onset conduct disorders, but not depressive disorders, were significantly associated with teenage pregnancy (Kovacs et al., 1994).

Consequences for female adolescents who demonstrate delinquency behaviors are more severe than for those not involved with the juvenile justice system. Crosby and colleagues (2004) collected data from nearly 200 detained adolescent females in order to identify the prevalence of health risk factors within this population. They found the mean age of sexual debut was 13 years and the mean number of sexual partners (lifetime) was 8.8 (Crosby et al., 2004). Of those reporting sexual activity, 33.9% had not used any form of contraception in the past two months and about 40% reported having recent sex with a casual partner (Crosby et al., 2004). Another study demonstrated similar findings and indicated that a high percentage of girls in the juvenile justice system reported being



sexually active (76%); on average, girls in this population reported their first sexual experience at 13.89 years (S.D. = 1.53) (Lederman, Dakof, Larrea, & Li, 2004). In this same study, sexually active girls reported having an average of 1.3 (S.D. = 1.7) sexual partners in the last three months and 34% reported being sexually involved with somebody more than five years older than them (Lederman, et al., 2004). Other studies have shown that conduct-disordered girls have a three- to five-fold increased risk of an early pregnancy compared to girls without a prior history of early conduct difficulties (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Kovacs, et al., 1994). Similar findings exist for studies focusing on African American teens, as Doljanac and Zimmerman (1988) found that conduct disorder and delinquency also correlate highly with risky sexual behavior in African American adolescents. Bardone and colleagues (1996) found that some conduct-disordered girls in their study displayed a multitude of risk factors for sexual behavior outcomes. These researchers followed a birth cohort from age 15 through age 21 and included girls without a mental health disorder and those diagnosed with depression and conduct disorder. This sample of children was assessed with a diverse battery of psychological, medical, and sociological measures at ten points throughout the study (i.e. at birth, ages 3, 5, 7, 9, 11, 13, 15, 18, and 21; Bardone et al., 1996). They noted that some girls left home as early as 15, lived with as many as four different men before age 21, and had more than one baby. By age 21, about a third of the sample had already borne a child and subsequently had low education attainment, and a low socio-economic status, which the researchers attributed to early pregnancy (Bardone et al., 1996).

Up until now, the literature review has identified studies that indicate delinquency and substance abuse are risk factors for risky sexual behaviors. Lanctot and Smith (2001), however, investigated and found the reciprocal relationship between these factors to be true. Lanctot and Smith (2001) utilized data drawn from the Rochester Youth Development Study (RYDS) to investigate the interrelationship between sexual activity, pregnancy, and deviance among a cohort of urban African American adolescent girls and compared the risk factors that predict these behaviors. The RYDS included separate interviews with teens and parents over approximately a four-year period (Lanctot & Smith, 2001). Their results indicate that girls who engage in early sexual activity and those who become pregnant are more likely to be involved in substance use and status offenses than girls who are not sexually active and who do not become pregnant (Lanctot & Smith, 2001). These results lend credence to the reciprocal relationship dimension of Bronfenbrenner's (1977, 1979) ecological theory because Lanctot and Smith's (2001) study provides empirical support for the bidirectionality of the relationships between early sexual activity, substance use, and delinquency.

Another hypothesis is that the relationship between delinquency and risky sexual behaviors may be non-causal and may arise because many of the social and contextual factors associated with early onset conduct problems are also independently related to an elevated risk of teenage pregnancy. With this idea in mind, Woodward and Fergusson (1999) note that higher rates of teenage pregnancy among girls who have early conduct difficulties might be better explained as reflecting a tendency toward risk taking and norm violation. This relationship might also be explained through reporting bias. It is also possible that early parenting (with pregnancy) increases the reporting of status

offense type conduct patterns as these girls adopt more adult roles or as they struggle to survive in disadvantaged circumstances. Woodward and Fergusson (1999) utilized longitudinal data from 1200 subjects who were studied for over 16 years. They found that girls with early onset conduct problems more often came from socially disadvantaged family backgrounds, characterized by low socioeconomic status, lower levels of maternal education, and being raised by young and single parents in below-average family living standards. However, even after extensive efforts to control for the effects of confounding factors, childhood conduct problems remained a significant predictor of subsequent teenage pregnancy, suggesting a possible cause and effect relationship between the extent of early conduct problems and later risk of teenage pregnancy.

Of all the literature reviewed, only one study examining various environmental risk factors did *not* find that conduct disorder correlated with sexual behaviors, after controlling for age (Bachanas et al., 2002). To measure delinquency, participants in the current study completed items from the delinquency subscale of the Youth Self Report, which includes questions about law-breaking behavior, antisocial behavior, as well as substance use (Achenbach, 1991)

*Excluded microsystem variables.* Several additional microsystem level variables were considered for inclusion in the study models; however, due to various reasons, were excluded. These include minority status, sensation-seeking, religiosity, self-esteem, depression, having a history of victimization, and knowledge.

Research suggests that being a member of a minority group and low social class is associated with sexual risk behaviors (Becker, Rankin, & Rickel, 1998; Rushton, 1989;

Rushton, 1999; Rushton & Bogaert, 1987; Schilling, El-Bassel, Schinke, & Nichols, 1991). J. Phillippe Rushton, in particular, has focused much effort on examining racial differences on numerous variables and concluded that a distinct pattern emerges with Orientals and African-Americans at opposite ends of the spectrum and Caucasians occupying an intermediate position, with a great deal of intra-racial variability within each broad grouping (Rushton, 1989). His controversial application of the *r-K* scale of reproductive strategy has received much criticism, with little comprehensive empirical support to contradict Rushton's findings. When specifically examining racial differences in sexual behavior, Rushton and Bogaert (1987) found that African-Americans had a greater number of premarital and extramarital partners, used fewer contraceptives, had a greater incidence of pregnancy, and had more permissive sexual attitudes than their Caucasian counterparts. Other studies, however, suggest that race does not impact sexual behaviors (Ickovics et al., 2002). In Blum and Mmari's (2005) meta-analysis, fourteen of fifteen international studies found that race and ethnicity were not significant risk factors for sexual behavior outcomes. Because the evidence for minority status as a sexual risk factor is debatable, it is not included as a variable in the current study. Additionally, minority groups in the study were under-representative of minority groups in the general population.

Sensation seeking, as defined by Zuckerman (1979), refers to stable individual differences in preferences for varied, novel, and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences. Several researchers have found sensation seeking to be a factor presumed to antecede sexual activity (Donohew et al, 2000; Lowry et al, 1994) and higher levels of sexual risk-taking

behavior are reported among youth who also score higher on measures of sensation-seeking (Brown, DiClemente, & Park, 1992; Neumark-Sztainer, Story, French, & Resnick, 1997). Sensation-seeking was not designated as a variable in the current study, because it was believed that impulsivity is correlated with sensation-seeking, therefore, characteristics of sensation-seeking individuals will likely be demonstrated on the impulsivity measure. For example, Zermatten, Van der Liden, d'Acremont, Jermann, and Bechara (2005) explored four facets of impulsivity, one of which was sensation-seeking, and Robbins and Bryan (2004) examined "impulsive-sensation-seeking" as one construct. Additionally, Dervaux et al. (2001) found impulsivity and sensation-seeking to be higher in substance abusing groups than in non-substance abusing groups, hypothesizing a level of correlation between impulsivity and sensation-seeking.

Opposing results regarding the role of religion in teens' sexual behaviors exist. Some studies note that adolescents who report higher levels of religiosity are less likely to engage in sexual intercourse (Bingham & Crockett, 1996; Crockett, Bingham, Chopak, & Vicary, 1996; McGill, 2000). However, other studies have noted religiosity to not reliably predict sexual risk behavior (Jemmott & Jemmott, 1992; Miller, Forehand & Kotchick, 2000). Because the religiosity as a risk factor for sexual behaviors is not consistently supported, it is not utilized as a variable in the current study.

Research findings have also been mixed regarding the connection between self-esteem and risky sexual behaviors, and is therefore not used as a variable in the current study. Of interest is that both high and low self-esteem have been linked with sexual risk behavior (Seal, Minichiello, & Omodei, 1997; Walter, Vaughan, & Cohall, 1991; Rosenthal, Moore, & Flynn, 1991). Previous research has suggested that low self-esteem

plays an important role in the development and maintenance of sexual risk behaviors (Joffe & Radius, 1993; Seal, et al., 1997); however, Kovacs and colleagues (1994) found no difference between the average levels of late childhood/early adolescent self-esteem of the subjects who eventually became pregnant and those who did not. Other researchers have also found that a self-esteem measure was not significant for correlation with risky sexual behaviors and concluded that self-esteem is often related to risky sex through attitudes about having sex (Langer, Warheit, & McDonald, 2001). Self-esteem may need to be differentiated from self-efficacy of specific preventive behaviors in order to reveal more consistent results.

Although there is much evidence describing a relationship between depression and risky sexual behaviors, this link is not clear and some have suggested an indirect relationship, which warrants further study. Because of this, it is not utilized as a variable in the current analysis. Several studies have noted the relationship between depression and sexual activity and it has been found that depressive symptoms are associated with increased sexual risk behaviors and reduced contraceptive practices (Berenson, Breitkopf, & Wu, 2003; Campos, 2001; Jackson, 2004; Orr, Celentano, Santelli, & Burwell, 1994; Ramrakh, Caspi, Dickson, Moffitt, & Paul, 2000; Shrier et al., 2001; Whitbeck, Conger, & Kao, 1993). Several additional studies indicate that depression and risky sexual behaviors are linked (Blatt, 1991; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Stiffman, Dore, Earls, & Cunningham, 1992; Shrier, Emans, Woods, & DuRant, 1996). Other studies indicate that there is not a direct relationship between depression and risky sexual behaviors (Bachanas, et al., 2002; Kovacs, et al., 1994; Shrier, et al.)

Browne and Finkelhor (1986) note that one of the areas receiving the most attention in the empirical literature are the long-term effects of sexual abuse on later sexual functioning. There are inconsistent findings regarding the relationship between sexual abuse and increased level of sexual activity sometimes demonstrated by victims, often referred to as promiscuity. Some studies have found a positive correlation between history of sexual abuse and promiscuity (Courtois, 1979; DeYoung, 1982; Herman, 1981; Meiselman, 1978); however, other studies found no difference and observed that having experienced child sexual abuse only predicted whether subjects would describe themselves as promiscuous, not their actual number of partners (Fromuth, 1983). Whether history of sexual victimization is linked to later high-risk sexual behaviors is inconclusive and thus, not used as a variable in the current study.

Common sense dictates that teens that are unaware of risk factors impacting their behaviors are less likely to alter those risk factors. An alarming example of this can be found in a retrospective chart review of 141 New Orleans adolescents infected with HIV (Kissinger, Fuller, Clark, & Abdalian, 1997). Although 52% of the participants identified they had acquired HIV through sex, 9% through injection drug use, and 2 % through infected blood products, a startling 37% of the participants were unable to identify their risk factor (Kissinger et al., 1997). One of the major concerns when working with teens is their naivety about their susceptibility to disease and harm; a developmental characteristic when teens feel they are invincible. Ethier, Kershaw, Niccolai, Lewis, and Ickovics (2003) found that teens who were diagnosed with an STD within the past year, continued to believe there was little or no chance they would obtain another STD in the coming year (Ethier et al., 2003). Two meta-analyses examining the link between sexual

knowledge and sexual behavior provided inconclusive results (Blum & Mari, 2005; Kotchick et al., 2001). Clearly more research needs to be done in this area, thus sexual knowledge is excluded from the current study as a variable.

#### *The Mesosystem: Familial and Extrafamilial Variables*

As stated previously, the mesosystem includes the social systems within which the developing individual interacts (Bronfenbrenner, 1977, 1979). Mesosystem variables have been identified as the settings for education, family, religion, and peer group—the most influential of these being the family. Research on the influence of families is extensive; however, research regarding the study of extrafamilial variables is lacking due to the difficulties in measuring these more global influences on the individual. For example, Blum and Mmari's (2005) recent meta-analysis of international literature found that no community-level factors were examined in relation to pregnancy or the contraction of sexually transmitted diseases. Despite the lack of study in the extrafamilial domain, these systems play an important role in influencing risky sexual behaviors, and will be discussed.

Several studies have found the family to be a critical influence on adolescents' sexual socialization, including sexual values, attitudes and behaviors, sex roles, and contraceptive use (Fisher & Feldman, 1998; Miller & Fox, 1987; Perrino, Gonzalez-Soldevilla, Pantin, & Szapocnik, 2000). One study claims that the family is the most proximal and fundamental context that influences adolescent behavior because parents influence other social contexts that affect adolescents' development of risky behavior (Perrino et al., 2000). Nelson and Keith (1990) examined data from an earlier study and applied hierarchical multiple regression to test both sex role attitude development and



behavior development models. Results of this study indicated that parents have a mediating function between the other systems and the early adolescent (Nelson & Keith, 1990). Another study found that strong parent-child relationships are directly associated with delayed sexual debut, countering the influence of peers on the odds of pregnancy experience (Moore, 1998). Ary and colleagues (1999) found that adolescent problem behavior most likely occurs in families with high levels of conflict, low family involvement, and inadequate parental monitoring. Other researchers investigating the role of familial factors in adolescents' initiation into sexual activity and contraceptive use have identified a number of key determinants, including family structure, communication between parent and child, and parental supervision (Wilder & Watt, 2002). Similarly, Rodgers (1995) found that parental monitoring, parental support, parental values, fathers' psychological control, and mothers' communication were significantly related to adolescent sexual risk-taking behavior. Along the same lines, Herring (1985) found that as perception of family cohesion increased, positive increases were noted in more conservative sexual values and attitudes. Familial mesosystem variables explored in the current study include family form, socio-economic status, mother's education level, communication, parental supervision, psychological control (teen autonomy), and parental warmth.

*Family form.* Family form refers to the physical composition of the family, whether it is a two-parent household, blended-family, single-parent family, or takes other forms. Living in a family with both parents implies the availability of support, supervision, and behavior control in the lives of adolescents (Podhisita, Xenos, & Varangrat, 2001), while a risk factor for teen pregnancy involves single-parent status

(Moore, 1998; Robbins, Kaplan, & Martin, 1985). Adolescents from single-parent families have been found to be more likely than peers from two-parent families to engage in health-compromising behaviors, including delinquency, violence, and unprotected sex (Dornbusch et al., 1985; Dornbusch & Gray, 1988) and are less likely to use condoms (Blum & Mmari, 2005). Additionally, Baughn-Cunningham (1999) found that adolescents living with a single parent were more likely to be sexually experienced than adolescents living with two parents.

In particular, the role of a father figure seems pivotal in influencing teen girls' engagement in sexual behavior. Blum and Mmari's (2005) meta-analysis of the developing country literature found that of the sixteen studies which examined the association between family structure and sexual experience among adolescents, nine found that when adolescents live with both parents, they were less likely to engage in sex than those who only lived with one parent or lived with someone other than their biological parent. Additionally, two of these studies specifically measured whether the biological father was present in the home and found that among females, the presence of a father at home during childhood and adolescence was independently associated with a later sexual debut (Blum & Mmari, 2005). Similarly, another study examined the relationships between age, gender, the presence of a father figure, perceptions of paternal attitudes toward premarital sex, and the adolescent's sexual behaviors (Dittus, Jaccard, & Gordon, 1997). Results showed that adolescent's perceptions of paternal attitudes toward premarital sex were predictive of teen sexual behavior, independent of adolescent's perceptions of maternal attitudes (Dittus et al., 1997). Ellis and colleagues (2003) investigated the impact of fathers' absence on early sexual activity and teenage

pregnancy in longitudinal studies (over a 5 year span) in the U.S. and New Zealand. After controlling for covariates, such as externalizing behavior problems, mother's age at first birth, race, socio-economic status, parental monitoring, and more, there was stronger and more consistent evidence for effects of fathers' absence on early sexual activity and teenage pregnancy than on other behavioral problems (Ellis et al., 2000). Rodgers' (1995) dissertation adds that fathers' psychological control predicted the likelihood of sexual risk taking among adolescent females in a logistic regression. Finally, Lonning's (1993) dissertation research investigated the strength of father-daughter relationships and the impact those relationships had on the sexual activity of the daughter in nearly 200 female subjects. A significant relationship was found between father-daughter relationships and onset of consensual sexual intercourse (Lonning, 1993). In the current study, family form is included in a checklist format with other demographic items.

*Socioeconomic status.* A family's socioeconomic status is strongly related to adolescents' participation in negative behaviors. Unfortunately, unsafe behaviors tend to compound the problems associated with low SES. Adolescents in welfare-dependent families exhibit the worst physical and mental health, and tend to engage in earlier onset of sexual activity and violent behavior than teens from other socioeconomic brackets (Bridgman & Phillips, 1998). Other studies have identified that youth from low-income families experience higher rates of poor physical and mental health, are more likely to engage in delinquent acts, have early and unprotected sexual intercourse, and are more likely to experience adolescent pregnancy, be arrested, and drop out of school (Duncan & Brooks-Gunn, 1997; Harris & Marmer, 1996). Numerous researchers have demonstrated that low socioeconomic status is related to teenage pregnancy (Abrahamse, et al., 1988;

Hanson, Myers, & Ginsburg, 1987; Lanctot & Smith, 2001; Robbins et al., 1985).

Conversely, a meta-analysis revealed a significant and positive relationship between contraception use and high SES in five of seven studies reviewed (Blum & Mmari, 2005).

Although not discussed in the meta-analysis, the positive connection between high SES and contraception use may be due health care access. Ickovics and colleagues (2002) examined the theoretical model in which stress and coping mediates the relationships of race/ethnicity and social class to sexual risk behaviors. In their research, results indicated that social class demonstrated direct and indirect associations with HIV risk behavior (Ickovics et al., 2002). More specifically, income was found to be an important factor in predicting sexual risk behaviors. Of interest is that risk takers, in general, are disproportionately likely to be economically disadvantaged (Harvey & Spigner, 1995; Miller & Moore, 1990).

Socio-economic status has been measured in various ways. For example, SES could be measured by a dichotomous variable of welfare receipt. Miller et al. (2005) utilized the mean of three measures (family income, mother's highest level of educational attainment, and father's highest level of educational attainment) in order to derive a comprehensive measure of family socioeconomic status. In the current study, participants of low socioeconomic status are identified as those eligible for free and/or reduced lunches at school, as it was believed that a large proportion of the participants could not reliably report their family income.

*Parents' education levels.* Parents' education levels have been found to be related to their teenagers' behaviors. For example, Koss (1985) found that children whose parents had less than a 12<sup>th</sup> grade education were 5.7 times more likely to have initiated

sexual intercourse and children whose parents had a high school education or equivalent were 7.0 times more likely to have initiated sexual intercourse compared to those children whose parents had a college level education. The reasons for the connection between parent education level and teens' behaviors are unclear, but it is speculated that expectations for the child's future and parental modeling likely play a role. In the present analysis, parent education levels were presented in a checklist format with other demographic items.

*Parental supervision.* Parental supervision has been identified as a significant factor in understanding the variation in initiation of sexual activity among adolescents in the United States and elsewhere (Hanson et al., 1987; Hogan & Kitagawa, 1985; Meschke & Silbereisen, 1997). Greater monitoring and less permissiveness are associated with delays in sexual debut, less frequent sexual intercourse, less risky sexual behavior, fewer sexual partners, and increased condom use among adolescents (Bynum, 1999; Miller, Forehand, & Kotchick, 1999; Romer et al., 1994, 1999). The opposite has also been found. Specifically, permissive parental attitudes are related to early sexual debut (Metzler, Noell, & Biglan, 1994; Rose et al., 2005; Small & Luster, 1994). Rose and colleagues (2005) concluded in their study of sexual attitudes of fifth graders that early adolescent's families and caregivers play an important role in delay of early sexual activities. Parental monitoring is also emerging as a consistent factor in reducing teen pregnancy risk (Crosby, et al., 2002; Miller, 1998; Miller, Benson, & Galbraith, 1994). In another study teens that reported that their parents generally knew who they were with, were more likely to be consistent dual-contraceptive users (Crosby et al., 2001).

Parents' actual monitoring may not be as important as the adolescent's perception of her parents' monitoring. As with other variables, perceptions of behavior seem to have as much of an impact as the actual behaviors. Donenberg, Wilson, Emerson, and Bryant (2002) evaluated sexual risk taking with regard to perceived parental monitoring/permissiveness, specifically investigating whether gender moderated these associations. They found that when parental permissiveness was perceived as high, girls, but not boys, reported increased sexual risk taking, a greater likelihood of using drugs and alcohol while having sex, and a decreased likelihood of using a condom during sex (Donenberg et al., 2002). High levels of perceived parental supervision have been found to predict fewer infections of gonorrhea and Chlamydia in female adolescents; however, it should be noted that the same relationship did not exist between perceived parental communication and gonorrhea or Chlamydia infections (Bettinger, 2004).

Parental monitoring has also been linked to varying rates of teen pregnancy among different racial groups and across gender. For example, East (1999) studied Mexican-American girls and found that families with pregnant and parenting teens versus those with "never pregnant" teens reported lower monitoring of their daughter's activities. Metzler et al. (1992) also found that lack of parental monitoring was associated with greater likelihood that adolescents would engage in high-risk sexual behavior. Parental monitoring is measured in the current study through the Perception of Parents (POP) Involvement scale.

*Parents' control and teen autonomy.* Parents who have a difficult time assisting their teenager with identity development and separation are often too controlling or not controlling enough. Parents' inability to support autonomy often leads to problematic

behaviors. Williams, Cox, Hedberg, and Deci (2000) found that adolescents who perceived their parents to be low in autonomy support were more likely to have extrinsic values (e.g., emphasis on fame as opposed to personal growth) and more likely to engage in a wide range of risky behaviors, including substance use and sexual activity. Similarly, children whose parents failed to accept and encourage their independence (those who overprotect, worry excessively about their children's health and safety, etc.) were also more likely to initiate sexual intercourse (Turner, Irwin Jr., Tschann, & Millstein, 1993).

Parental support of autonomy may have both long lasting and relatively immediate effects. Wilder and Watt (2000) found that parental supervision had a substantial effect on the likelihood of early sexual experience. Specifically, they found that high levels of paternal supervision discouraged sexual activity among male adolescents, whereas high levels of maternal supervision discouraged sexual activity (including very early sex) among females (Wilder & Watt, 2000). McLaughlin and colleagues (1997) explored ethnic and gender differences in sexual behavior and its correlates among Caucasian and Asian American college students. These researchers found that for Caucasian American females, conflict and autonomy in decision making has some utility in predicting level of sexual experience throughout their adolescent development, rather than just in the girls' early teens (McLaughlin et al., 1997). The Perception of Parents Autonomy Subscales were utilized in the current study to measure participants' thoughts about parental support of autonomy.

*Parental warmth.* The quality of family relationships, particularly children's relationships with their parents, is demonstrably associated with adolescent sexual

behavior. For example, Whitbeck et al. (1993) measured parental warmth and supportiveness with eight self-report items completed by teenage daughters. Items asked respondents to rate the frequency with which each parent exhibited supportive, involved behaviors toward that adolescent (Whitbeck et al., 1993). Items dealt with the extent to which parents talked with the adolescent about things going on in the child's life, talked over problems with the adolescent, discussed things bothering the adolescent, gave the adolescent a voice in family decisions, and the degree to which the parent showed approval, trust, and caring toward the child (Whitbeck et al., 1993). Whitbeck and colleagues (1993) found a strong correlation between parental warmth and supportiveness and sexual behaviors. Similarly, Miller, Norton, Fan, and Christopherson (1998) found a strong and consistent relationship with family cohesion and adolescent reports of less frequent sexual activity, fewer sex partners, and later age of sexual debut. Several researchers note that teens who view their parents as warm and supportive (Jessor & Jessor, 1975; Metzler, Noell, Biglan, Ary, & Smolkowski, 1994) and who feel there is good communication between themselves and their parents (Fox & Inazu, 1980) are less likely to be sexually experienced. Parent-child connectedness, as measured by perceived support, closeness, or warmth, has consistently been found to have a strong relationship with sexual behaviors (Benda & DiBlasio, 1991; Miller, et al., 1994; Moore, 1998; Resnick et al., 1997; Smith 1997; Whitbeck, Hoyt, Miller, and Kao, 1992). Similar to research indicating that lack of parental warmth may lead to risky sexual behaviors, Finkelhor (1980) found that girls who reported their mothers to be emotionally distant or unaffectionate were at higher risk for sexual victimization. Of interest is Moore's (1998) finding within a sub-population of low income Black female youth that strong parent-



child relationships decrease the influence of peers on the odds of pregnancy. Only one study reported that perceived family support was not significantly associated with safe sex attitudes (Chang, Bendel, Koopman, McGarvey, & Canterbury, 2003).

Communication seems to be an important subcomponent in characterizing a “warm” relationship between caregiver and child. Even though many parents admit to feeling extremely uncomfortable in talking with their children about sex, the importance of good communication is a concept that few clinicians would argue against. Studies have indicated the importance of communication between parents and children for delaying sexual activity (Franklin, Corcoran, & Ayers-Lopez, 1996). Somers and Paulson (2000) found that parent-adolescent communication about sexuality was related to certain adolescent sexual outcomes, such as more conservative attitudes toward premarital sexual intercourse. Christopherson (1993) found that parent-teen communication quality had a significant positive effect on teen sexual abstinent values. Abell (2003) studied the impact of communication with parents on sexual attitudes among economically disadvantaged females and found that female teens with strong communication and social bonds with their parents about sex will have greater self-efficacy at sexual refusal. Tannenbaum’s (2002) dissertation research examined the role of the parent-adolescent relationship in promoting healthy protective sexual behavior among African-American female adolescents. With a sample of over 600 participants, Tannenbaum (2002) found that relationship quality significantly moderated associations between parent-adolescent communication and adolescent sexual behavior such that in the context of a warm, supportive parent-adolescent relationship, an open reciprocal communication process predicted healthier sexual behavior. Rose et al. (2005) examined

a nonrandom sample of 408 fifth graders and their caregivers. The children answered questions regarding sexual intercourse and other risk behaviors, while their caretakers answered questions about parenting factors, such as monitoring behaviors and parent-child communication. Bivariate and multivariable analyses examined the association of these variables with the teens' behaviors (Rose et al., 2005), finding that initiation of sexual intercourse was related to higher levels of barriers to communication (Rose et al., 2005). In other words, children who initiated sexual intercourse at an earlier age or participated more often in sexual intercourse were more likely to have barriers in their communication efforts with parents. The current study measures parent affection, cohesion, and communication as the construct of "warmth" on the Perception of Parents Warmth Subscale.

*Peer subsystem.* Adolescence is marked by the establishment of close, intimate relationships with same- and opposite-sex peers. It is during this developmental period that teens start relying more on friends for advice and companionship as they slowly individuate from parents. Almost any teen would cite their friendships with peers as one of the priorities in their lives. Before discussing the influence of peers on individual's behaviors, it should be noted that the directionality of peer influence is unclear. As Podhisita et al., (2001) point out, it is not clear whether adolescents are mimicking the actual or imagined behavior of their peers, or whether once they initiate sexual activity, they tend to associate with others whom they perceive to also be sexually active.

There is abundant evidence that sexual activity among adolescents is strongly influenced by others, particularly their friends (Blum & Mmari, 2005; Davis & Harris, 1982), especially association with sexually active peers (Benda & DiBlaso, 1994). Of ten

studies that examined the relationship between perception of peers' sexual behaviors and their own sexual experiences, Blum and Mmari (2005) noted that all ten studies found a positive relationship between the two factors. Evidence was also noted for an increase in pregnancy risk when a teen has a friend who has been pregnant (Blum & Mmari, 2005). Similarly, a dissertation by Low (2005) used structural equation modeling to examine whether friends' characteristics were related to participants' sexual behaviors concurrently and over a one-year period, and whether participants' sexual behaviors are predictive of changes in friendship characteristics over time. Low (2005) found that characteristics of close friends were associated with the participant's current sexual behavior, but not with changes in sexual behavior over time. Additionally, having friends with more dating involvement and having friends with more social approval for sexual involvement was predictive of more frequent sexual behavior over time (Low, 2005). Adolescent females who associate with older boys have higher risk of early sexual behavior. In an analysis using a national sample of American teens, it was found that peer group structure and interactions, specifically higher proportions of older boys in the early maturing girl's friendship group, were predictive of earlier sexual behaviors (Cavanaugh, 2001). As stated earlier, early developing girls frequently attract older boys because the girls appear older than their chronological age. Based on a middle class sample, Gowen et al. (2004) found that the sexual behaviors and attitudes of girls with older boyfriends differed significantly from girls with similar-aged boyfriends. Specifically, girls with older boyfriends were more likely to engage in intimate levels of sexual activity, to have sexual experiences in unsafe situations, and to endorse beliefs that were likely to put them at risk than girls with similar-aged boyfriends (Gowen et al.,

2004). Gowen and colleagues (2004) hypothesized that girls with older boyfriends are more likely to accommodate the greater sexual demands of an older male. These efforts are reflective of their need to please their more powerful and more sexually active partners, and to maintain a relationship that gives them status and gratification. It should be noted that one dissertation was found which explored the impact of communication with peers on sexual attitudes among economically disadvantaged females (Abell, 2003). The hypothesis that females who communicate often with their peers about sex will have less self-efficacy at sexual refusal was not supported (Abell, 2003). The remaining literature described focuses on two aspects of peer influence; 1) the perception that peers have sex; and 2) problematic behaviors common to the peer group.

*Perception that peers have sex.* As with parental supervision, perception of actions may be more influential than actual behaviors. For example, young peoples' beliefs about their friends are more strongly associated with their sexual behaviors than with friends' actual behaviors (Hayes, 1987). Additionally, three studies in a meta-analysis looked at the association between the perception that peers have had sex and the number of sexual partners of the subject; all three studies found a significant relationship (Blum & Mmari, 2005). These findings are important, as it would be difficult for researchers to link each adolescent to each of her friend's actual sexual behaviors.

The importance of perception appears to apply to group influences as well; not only do peer group *behaviors* influence the individual's behaviors, but peer group *expectations* influence the individual's behaviors. Watts and Nagy (2000) found that peer expectations for alcohol use and engagement in sexual activity to be significantly correlated with attitudes toward sexual activity among adolescents. Another study noted

that friends' approval of deviance places adolescent girls at greater risk for sexual activities (Jessor et al., 1983).

Measuring peer perceptions is less reliable because confirmation from an outside source is difficult. Whitbeck et al. (1992) measured perceptions of friends' sexual behaviors by asking adolescent females to indicate whether she thought her close friends dated, engaged in heavy petting, and/or had engaged in sexual intercourse, with response categories ranging from 1 (none of my friends participated in this activity) to 5 (all of my friends participated in this activity). The current study copied this approach and asked participants if they have at least one friend who has dated someone five years or older, whether participants' friends have had more than three sexual partners, and whether their friends use condoms.

*Peer behaviors.* The old adage, "Birds of a feather, flock together," may best describe the similar behaviors found in peer groups or cliques. For example, teens that are interested in art choose friends with similar interests. The same type of affiliation can be said of deviant behaviors, including risky sexual behaviors, present in members of a peer group. Strong peer affiliation and the perception that peers are not engaging in preventive health behaviors were related to a greater likelihood that the adolescent would be sexually experienced (Boyer, et al., 1999). These same teens were noted to be more likely to engage in other risk behaviors compared to those teens that are less socially connected to their peers (Boyer et al, 1999). Association with deviant peers encourages the transition from virginity to nonvirginity, particularly among females (Jessor and Jessor, 1975). Previous studies have reported that African American youths who report

that their peers engage in high-risk behaviors also report engaging in risky sexual behaviors (Black, Ricardo, & Stanton, 1997; Millstein & Moscicki, 1995).

Unfortunately the international research (in developing countries) does not add to our understanding of peer influences, due to few studies examining this factor. Blum and Mmari's (2005) meta-analysis did not find enough studies examining peer and partner variables to make conclusive statements regarding those relationships to sexual behaviors. To identify peer group behaviors, participants in the current study were asked if their friends used illegal substances and/or got into trouble a lot.

*Excluded mesosystem variables.* Parental monitoring, sibling influences, underachievement, lower academic goals, and school belonging were also reviewed as possible variables for this study's models; however, for various reasons were excluded and are briefly discussed here. When reviewing the literature, three studies were found which analyzed the effect of parental modeling of risky behaviors on their children's behaviors with conflicting results. Some studies noted links between parental monitoring of risky sexual behaviors and their children's demonstration of risky sexual behaviors (Kovacs, et al., 1994; Wilder & Watt, 2002) while another study did not find this link (Mellins, Brackis-Cott, Dolezal, & Meyer-Bahlburg, 1997). As with other variables with mixed support, parental modeling is excluded from the current study.

The influence of sibling's behavior on sexual activity is relatively unexplored; only two studies were found addressing this influence, each with opposing conclusions (Callor, 1993; Kornreich, Hearn, Rodriguez, & O'Sullivan, 2003). The possible effect of sibling influence on sexual behaviors was not utilized as a risk factor in the present analysis because it lacks empirical support at this time.

The role of underachievement and low academic aspirations clearly play a part in teens' sexual behaviors but could not be measured in the current study due to administrative barriers. However, the majority of research reviewed found empirical support for a connection between sexual activity and underachievement (Blum & Mmari, 2005; Hardy, Astone, Brooks-Gunn, Shapiro, & Miller, 1998; Martin et al., 2005; Scaramella, Conger, Simons, & Whitbeck, 1998) and between sexual activity and low academic aspirations (Blum & Mmari, 2005; Chang et al., 2003; Costa, et al., 1995; East, 1998; Handler, 1990; Harris, et al., 2002; Hendricks & Montgomery, 1984; Hogan & Kitagawa, 1985; Jessor & Jessor, 1975; Schvanevelt, Miller, Berry, & Lee, 2001; Scott-Jones & White, 1990; Streetman, 1996; Upchurch & McCarthy, 1990).

Additionally, one dissertation study found examined the relationship between perceived school belonging and high-risk sexual behaviors in female adolescents and found a negative relationship between the variables (Jackson, 2005). Although school belonging was not examined in the current study as a separate construct, items on the attitude measure address whether participants feel supported by the school environment for their sexual/relationship attitudes.

#### *The Exosystem: Population Density, Poverty, and Arrest Rates*

Within the context of ecological systems theory, neighborhood characteristics would be considered the exosystem—a setting in which the individual does not directly interact but which has influence (Bronfenbrenner, 1977). The exosystem has received little attention in the literature, perhaps because of the difficulty of measurement; however, the influence of rural versus urban settings, poverty, and arrest rates on sexual behaviors is important and will be discussed in the following sections.

One study was reviewed which compared neighborhood population density (i.e. urban, rural, suburban) as a risk factor for high-risk sexual behaviors. Levine and Coupey (2003) analyzed data from the YRBS to determine if urban youth (“metropolitan” status) were at greater risk of engaging in risk behavior than suburban or rural youth. They found no significant differences between rural and suburban youth, later combined as “non-urban,” and they found no significant differences in risk behaviors between urban and non-urban youth (Levine & Coupey, 2003). Similarly, Chen (2004) examined influences of multi-level environmental factors on adolescent risky sexual behavior with data drawn from the National Longitudinal Study of Adolescent Health. Using hierarchical multiple regression to estimate the added contribution of each set of predictors to the explanation of risky sexual behavior, school and neighborhood factors did not predict risky sexual behavior (Chen, 2004). A few studies have found that disadvantaged neighborhoods place adolescent girls at risk for early sexual activity and pregnancy through loosened social control (Manlove, 1997; Schellenbach, Whitman, & Borkowski, 1992). Blum and Mmari’s (2005) international literature meta-analysis did not reveal the same findings related to poverty-stricken neighborhoods and sexual initiation. They reported that only one study examined the relationship between community-level factors and sexual initiation among adolescents, finding that community-level effects were generally not significant and inconsistent across countries of sub-Saharan Africa (Gupta & Mahy, 2003). In another study, neighborhood characteristics were defined as a combination of socioeconomic status, family structure, and community arrest rates (Lanctot & Smith, 2001). This study utilized census data to denote the percentage of households living in poverty and the percentage of households



headed by a single mother, while community arrest rates were gathered from local police data (Lancot & Smith, 2001). Results indicate that teens living in a more disorganized neighborhood, having low school expectations, holding deviant values, being a gang member, and engaging in status offenses in early adolescence were the most influential predictors of sexual activity (Lancot & Smith, 2001). Although these researchers explain the aforementioned risk factors as constructs of neighborhood characteristics, they seem better explained as familial and individual characteristics.

*The Macrosystem: Race, Institutional Barriers, the Media, and Technology*

At the macrosystem level are the cultural and societal values that influence individuals. Characteristics of the macrosystem, like the exosystem, are rarely empirically studied, but are often noted as considerations. This study follows in suit.

Although it is extremely difficult to determine the amount of influence that cultural or societal expectations and socializations have on later sexual behaviors, there is little argument that the influence exists and is strong. This influence has been examined in terms of race and differences between various ethnic and racial groups have been found in the literature. For example, Abrahamse and associates (1988) noted differences in attitudes toward early pregnancy and single parenthood across various racial groups in the United States; thus the potential utility of early onset conduct disorder as a marker for teenage pregnancy must take into account the broader societal or subcultural context. African American teens have been found to participate in sexual intercourse at earlier ages than Caucasian teens (Ompad, et al., 2006), at a higher percentage rate (Grunbaum et al., 2002), and having more sexual partners (Grunbaum, 2002). Cazanave (1981) argued that male African-American teens possess a survival culture and are socialized to

emphasize a general toughness, including sexual conquests and liquor and drug consumption. Other variables of sex-related behaviors have demonstrated racial differences as well. When examining the likelihood of condom use, Cox (2006) found that maternal demandingness predicted increased likelihood of condom use in African American adolescents but decreased likelihood of condom use in Caucasian adolescents. Subsequently, youth of color suffer relatively higher rates of HIV and STDs (CDC, 2001; CDC, 2002). Martino, Collins, Kanouse, Elliott, and Berry (2005) examined the processes mediating the relationship between exposure to television's sexual content and adolescent's sexual behavior. They found support for a model in which the relationship between exposure to TV's sexual content is mediated by safe-sex self-efficacy among African Americans and Caucasians, but not among Hispanics. Additionally, a disparity exists between racial groups regarding sexual behavior consequences. Hispanic teens have higher birth rates than any other group—86.4 per 1,000 women ages 15 to 19 compared to 71.8 among African American teens; 56.3 among Native American; 30.3 among white, non-Hispanics; and 19.8 among Asian and Pacific Islander teens (Hamilton, et al., 2003). In a 1988 study, Howard found contradictory results to the aforementioned studies, which evaluated the utility of cultural and structural perspectives in accounting for interracial patterns in adolescents' judgments about sexual intimacy. She noted that the responses of Black and White adolescents were much more similar than they were different (Howard, 1988).

Other societal factors impress upon adolescents' sexual behaviors, in both positive and negative ways. For example, Finkel and Finkel (1981) found that institutional barriers often serve to limit the dissemination of birth control information

and services to teenagers. Since the time of Finkel and Finkels' 1981 study, improvements have been made in alerting teens to their birth control options. Legislation has also included a stance on adolescent sex. Starting in the 1970's, a coherent body of law emerged with respect to adolescent sexual behaviors. Two legal principles were put into play: (1) mature minors have a constitutional right to obtain reproductive health services on their own consent, and (2) all minors have a constitutional right to have an alternative to parental involvement in implementing their decision about such health care (Paul and Pilpel, 1979). These laws provide an adolescent with more autonomy in sexual decision-making, as opposed to requiring parental consent. In other words, teens can seek medical advice regarding sexual issues independently, regardless of how open they are with their parents about their sexual questions and/or behaviors.

The media is a strong cultural influence on children and many parents and researchers worry about the messages that children receive from various media sources. An interesting study conducted by Wingood and peers (2003) sought to determine whether exposure to rap music videos at baseline could predict the occurrence of health risk behaviors and sexually transmitted diseases among African American adolescent females over a 12-month follow-up period (Wingood et al., 2003). They found that, compared to adolescents with less exposure to rap videos, those with greater exposure were two times more likely to have had multiple sexual partners and more than 1.5 times more likely to have acquired a new sexually transmitted disease over the 12-month follow-up period (Wingood et al., 2003). They explain their findings through the social cognitive theory postulating that rap videos, which are explicit about sex and violence, while rarely showing the long-term effects of risky behaviors, may influence adolescents

by modeling these unhealthy practices (Wingood et al., 2003). A weakness of this study is that potential mediating factors were not assessed and it was not determined whether the relationship between rap video exposure and adolescents' health status was causal. Another study documenting music video viewing habits in relation to sexual risk behavior of African American teens found that viewing rap music videos was associated with less traditional attitudes toward women (Robillard, 2000). The researcher noted that of importance was the finding suggesting a predictive relationship between exposure to negative images of women in music videos and the perceived level of influence from music videos (Robillard, 2000). In another study exploring media influences, Brown and colleagues (2005) recruited teens from middle schools to complete two self-administered surveys about their pubertal status, interest in and exposure to various media, and perceptions of sexual media content in order to investigate the possibility that the mass media serves as a kind of "super peer" for girls who enter puberty sooner than their age-mates. Findings indicate that earlier maturing girls reported more interest than later maturing girls in seeing sexual content in mass media, regardless of age or race (Brown et al., 2005). More importantly, earlier maturing girls were also more likely to interpret the messages they saw in the media as approving of teens having sexual intercourse than their age-mates (Brown et al., 2005). In a review of the developing country literature, two of three studies reviewed found that adolescents, particularly male adolescents, who watched movies on a regular basis were more likely to have had premarital sex (Blum & Mmari, 2005). This connection was not found for females.

As technology changes, so does our use of technology in interacting with others as well as the influence of technology on behavior. A retrospective quantitative study by

Crisanto (2006) examined the online relationships of college females ages 18 to 25, responding as they would have during adolescence. Results of this dissertation suggest that girls are more susceptible to sexual behaviors online that are socially isolated, have low self-confidence, and experience family conflict (Crisanto, 2006). A major safety concern, Crisanto (2006) found that females who spent more time in chat rooms were more likely to provide their addresses and phone numbers online; however, the study found that involvement in online sexual activity did not necessarily lead to increased offline sexual behavior.

### *Self-Report Issues*

Whenever the primary source of information about an individual is the individual herself, self-report issues must be considered and controlled for as much as possible. When measuring sexual behaviors/attitudes, the issues of self-report bias become even greater. Therefore, a review of empirical management of self-report of teens' sexual behaviors was conducted.

Studies have shown that adolescent females do not accurately perceive their susceptibility to sexually transmitted diseases and tend to underestimate their sexual risk behavior to a single reproductive health outcome, such as whether they become pregnant (Ethier et al., 2003). Self-reports of sexual activity are also influenced by self-presentation (fear of reprisal, social desirability, cultural values, etc.; Gowen et al., 2004). Despite the sensitivity of self-report sexual information, there is research to suggest that adolescents are able to accurately and reliably report sexual behavior and history of STDs (Hornberger, Rosenthal, Biro, & Stanberry, 1995; Orr, Fortenberry, & Blythe, 1997; Rosenthal, Burlow, Biro, Pace, & DeVellis, 1996).

Fortunately, controlling for social desirability is a strategy that has been well documented in the literature. It is expected practice that researchers will employ several methods to increase the likelihood of accurate responses. For example, even most novice researchers know that consent forms should include a statement of confidentiality and all questionnaires inquiring about sensitive information should be anonymous. It is also recommended that the questionnaire administrator verbally stress the importance of honest reporting for the development of programs to help others. Several studies suggest that self-presentation bias can be minimized under conditions that allow more privacy than face-to-face interviewing typically permits, such as self-administered questionnaires and computer-assisted surveys (Romer et al., 1997; Turner, Lessler, & Devore, 1992; Turner et al., 1998).

Utilization of a social desirability scale for validity purposes is also a recommended strategy to increase the likelihood of receiving meaningful data. Although the Marlowe-Crowne Social Desirability scale (1960) is widely used to assess and control for response bias in self-report research, this scale was not used in the current research due to Barger's (2002) findings that the Marlowe-Crowne scale (MC; 1960) and its various short forms as a control for response bias is discouraged on empirical and conceptual grounds. Barger's (2002) analysis revealed a multidimensional structure to the scale that indicated that the apparent adequacy of model fit for some short forms might be a statistical artifact. In other words, the short forms of the MC scale appear to be inadequate as unidimensional proxies for the full MC scale. The Social Desirability Scale was also ruled out because its content included maladjustment items and its validation encompassed clinical diagnostic criteria (Barger, 2002; Edwards, 1957). Due

to these concerns, the Balanced Inventory of Desired Responding scale was used in the current study (Paulhus, 1984). The BIDR-Impression Management (IM) subscale measures the subject's deliberate presentation to an audience and subscale scores demonstrated high internal consistency and test-retest reliability (Paulhus, 1984). Specific psychometric properties of the BIDR-IM subscale are detailed in the methods chapter.

In addition to social desirability, other issues have been found with self-report instruments. One such issue is whether teens can accurately recall their behaviors after a specified amount of time. The complexity of sexual activity patterns may also influence adolescents' ability to recall behavior. Gowen et al. (2004) demonstrated that adolescent girls could reliably report sexual behavior and contraceptive use over a six-month interval (of frequent behaviors). Another study examined two issues relevant to adolescents' self-reported sexual and contraceptive use behaviors: reliability of partner-referent reports versus three and six month reports, and test-retest reliability of reports completed over a two-week period (Sieving et al., 2005). Findings demonstrate that adolescent girls can reliably report sexual behavior and contraceptive use over a six-month interval. (Sieving et al., 2005). Studies examining sexual behaviors recommend that partner-specific reporting methods may be useful in assessing contraceptive use behaviors (Gowen et al., 2004). Higher reliability (of self-report measures of sexual behaviors and contraceptive use) may also be obtained by asking participants to choose from meaningful response categories such as once, less than one a month, 1-3 times per month, more than 3 times per month, rather than to provide an exact number (Gowen et al., 2004). Another way to reduce self-preservation bias is through the type of survey used and details about the items. It has been found that survey instruments, which provide detailed explanations of

sexual terms and frame sexual questions using non-judgmental and developmentally appropriate wording may help reduce this bias (Hearn, O'Sullivan, & Dudley, 2003; Romer et al., 1997). When inquiring about behaviors over time, providing participants with a calendar can increase accuracy of reports and to decrease the probability that a student's difficulty with reading interfered with responses, an audio tape version of the questionnaire can be made available.

### *Focus of the Current Study*

This study extends previous research in several important ways. As noted by Wolfe et al. (2005), until the past decade, research on adolescent dating patterns and behaviors typically focused on college students or young adults, with little interest in the early adolescent years. The current study focuses on adolescents ranging in age from 14 through 17 in an effort to gather information on the formation of risky sexual behaviors and attitudes especially those that occur before high school graduation. Similarly, although factors that influence sexual risk behaviors differ greatly between males and females, the majority of studies do not separate the two groups in analysis (Blum & Mmari, 2005). The current study examines female attitudes specifically, to provide insight into the factors that affect that gender. Also, little research has been conducted in support of delineating the processes through which specific risk factors exert their influence (Hunter et al., 2004). Kotchick et al. (2001) add that little or no attention has been given to potential mediational, moderational, and nonlinear relationships among the variables and systems of influence found to be related to sexual outcomes. They propose that research efforts so far have been hampered by the adoption of models and perspectives that are narrow and do not adequately capture the complexity associated



with the adolescent sexual experience (Kotchick et al., 2001). Although it may not be possible to capture the complexity involved with adolescent sexual behaviors, a multi-systems perspective seems the best route for doing so, which is why it is employed in this study.

For the purposes of this study, risky sexual behaviors have been operationalized as having one or more of these empirically-based sexual behavior outcomes: early age at first sexual experience age with the cutoff age of 16 based on prior studies (Lancot & Smith, 2001; Smith, 1997; Woodward and Ferguson, 1999); having had an STD or pregnancy, high number of sexual partners with the cutoff at five or more partners prior to age 18, and a low frequency of contraceptive use defined as those who respond that they do not use contraception consistently.

Based on information in the literature review, it is hypothesized that adolescent females' attitudes regarding sexual/relationship behaviors will have a significant mediating effect between environmental and individual risk factors and risky sexual behaviors. In other words, it is hypothesized that a model, which includes both individual/environmental risk factors and attitudes, will better predict sexual behavior outcomes than models which include only risk factors or only attitudes to predict sexual behavior outcomes. Mediation denotes the ability of a mediating variable to explain the relation between two other related variables (Salazar et al., 2005). Moreover, mediation indicates that an initial variable (usually intervention) causes a change in an outcome variable (such as condom use) by exerting influence through various mediating variables (e.g. attitudes toward condom use; Salazar et al., 2005). The appropriateness of mediational testing in this study is detailed in the Methods chapter. Additionally, it is

hypothesized that, of the three models, the full model including environmental risk factors, risky sexual behavior outcomes, and attitudes as a mediating factor is predicted to fit the collected data best as noted on goodness of fit statistics.

## CHAPTER THREE: METHOD

The purpose of this study was to measure participants' levels of environmental risk factors, their attitudes regarding sexual behaviors, and their risky sexual behaviors and to assess proposed relationships among these variables in hopes of improving prevention efforts. The literature on the connections between these variables is clear; the more risk factors a teen possesses, the more likely it is that she will engage in risky behaviors, including sexual activities. Attitudes have been shown to impact behaviors, but the degree of influence has yet to be determined. Thus the influence of attitudes on behavioral outcomes is the focus of the current study. Questionnaire data were obtained via survey methods and analyzed through structural equation modeling to determine the strength of the relationships among variables, in the format of three models: 1) a direct path between environmental risk factors and risky sexual behavior outcomes; 2) a direct path between attitudes and risky sexual behavior outcomes; and 3) an indirect path between environmental risk factors and risky sexual behavior outcomes, with attitudes as a mediating factor. It was planned for mediational testing to be conducted to determine the significance of attitudes as a mediating factor; however, due to a lack of significance between the predictor and outcome variables, mediational analysis was not applicable. This chapter describes the procedures used in the investigation. Specifically, details regarding the subjects, instruments, design and methodology are described.

### *Subject Recruitment*

Participants were recruited from four Missouri school systems with administrators known to this investigator and through the Missouri School Directory (Missouri

Department of Elementary & Secondary Education (DESE), 2005). Subject size was determined by considering the recommended subject-to-variable ratios for yielding stable findings for SEM. Cone and Foster (2005) note that typical sample size for studies using SEM is between 7 and 20 participants for each observed variable. The dissertation proposal committee agreed that ten participants per variable was appropriate for the current study. As thirteen variables are used in this study, more than 130 participants were recruited in order to increase the likelihood of finding meaningful results. Additionally a power analysis was conducted post-hoc to estimate the strength of the study given the number of participants. Effect size is a set of statistics that indicates the relative magnitude of the differences between means, or in other words, the “amount of the total variance in the dependent variable that is predictable from knowledge of the levels of the independent variable” (Tabachnick & Fidell, 2001, p.52). For structural equation modeling, effect size is based on the root-mean-square error of approximation (RMSEA) (MacCallum, Browne, & Sugawara, 1996). MacCallum and colleagues (1996) stress that when testing a hypothesis about model fit, it is highly desirable to test a meaningful, relevant hypothesis and to draw the correct conclusion about that hypothesis; power analysis allows one to know the likelihood of drawing the correct conclusions when the hypothesis test is conducted. In the current study, with  $p \leq 0.05$ ,  $d = 0.43$ , power is determined to be moderate.

To be included in the study, participants were female and of any age between 14 and 17. This age range was chosen to focus on teenage sexual behaviors and attitudes, particularly those behaviors experienced prior to high school graduation. Because

females were the focus of the study, males were excluded, as well as any participants whose age fell outside the designated age range.

Participants with incomplete measures and measures with questionable validity were excluded from analysis. One case had more than 25% of questionnaire items missing, thus the case was dropped from analysis. Thirty more cases were excluded from statistical analysis due to missing items on measured subscales. Additionally, questionnaires with scores of 9 or higher (one standard deviation above the mean) on the Balanced Inventory of Desirable Responding-Impression Management (IM) Scale were discarded because this reflects deliberate self-presentation through socially desirable responses (Paulhus, 1984). This exclusion criterion was based on Paulhus' 1988 research, which found mean scores of a college student sample for the IM subscale to be 4.9 (SD = 3.2) for females. Based on this criterion, 17 additional cases were excluded from the study. In short, of 150 completed questionnaires, the total sample size for analysis was 102 participants.

### *Subject Characteristics*

Subject characteristics are listed in Table 1 and detailed in this section. Participant grade level composition included that the majority of participants were in 10<sup>th</sup> grade (25.8%) with a mean age of 15.1 years (SD = 1.74). The remaining grade frequencies were as follows: 8<sup>th</sup> grade (18.9%), 9<sup>th</sup> grade (18.2%), 11<sup>th</sup> grade (15.9%), and 12<sup>th</sup> grade (14.4%). Seven participants (5.3%) of the sample indicated that 8<sup>th</sup> through 12<sup>th</sup> grade did not adequately describe their grade levels at school and two participants (1.5%) did not respond to this item. Participants' racial characteristics include 115 Caucasian participants (87.1%). Seven participants were African American (5.3%), three

participants were Hispanic/Latina (2.3%), three participants were Native American (2.3 %), three participants were bi/multi-racial (2.3%), and one participant (0.8%) indicated that none of the racial options applied to her. Comparing participant racial characteristics to those of Missouri, African American teens are underrepresented in the study as Missouri estimates a population of 11.1% African Americans (Missouri Census Data Center (MCDC), 2000). Missouri's population includes approximately 81.2 people per square mile, which is similar to the population density from the counties utilized in the study sample (average of 122.9 people per square mile) (MCDC, 2000).

As a measure of socioeconomic status, 28.8 % of participants indicated that they were eligible to receive free or reduced lunch at school, whereas 62.9% of the sample indicated they were not. This percentile is lower than the 40.5% of Missouri students who were enrolled in free/reduced prince school lunch in 2004 (Citizens for Missouri's Children, 2005). Eleven participants (8.3%) did not indicate their eligibility to receive a free or reduced lunch on the demographic questionnaire.

#### *Institutional Review Board Approval*

Approval from the Institutional Review Board (IRB) at the University of Missouri-Columbia was received September 7, 2006. Although this study involves sexual issues, considered sensitive by most, review by the full board was not required due to the anonymity of the data. Approval was received prior to any data collection.

#### *School Solicitation*

Potential participating school districts were obtained through the Missouri School Directory (Missouri DESE, 2005) and my contacts as a mental health professional. As an

*Table 1. Participant Demographics*

Participant Characteristic	Reported Frequency
Age	Mean = 15.1 years (SD = 1.7 years)
Year in School	
10 <sup>th</sup> grade	25.8%
8 <sup>th</sup> grade	18.9%
9 <sup>th</sup> grade	18.2%
11 <sup>th</sup> grade	15.9%
12 <sup>th</sup> grade	14.4%
None applied	5.3%
Racial/Ethnic Background	
Caucasian	87.1%
African American	5.4%
Hispanic/Latina	2.3%
Native American	2.3%
Bi/Multi-racial	2.3%
None applied	0.8%
Eligible for Free/Reduced Lunch	28.8%
Age of Menarche	
12 or older	63.6%
11 years old	18.9%
10 years old	9.8%
8 or 9 years old	5.3%
Not yet reached menarche	1.5%
Family Structure	
Two-parent household (married, with no previous marriages)	43.2%
Two-parent household (married, either was previously married)	28.8%
Single parent household	18.9%
Two-parent household (not married)	2.3%
Living with relatives (not parents)	1.5%
Living with friends	1.5%
None applied	3.8%
Mother's Education Level	
High school (or equivalent)	25.8%
Some college/vocational school	25.8%
Bachelor's degree	21.2%
Master's degree or higher	9.8%
Some high school	5.3%
Junior high/8th grade or less	1.5%
Do not know	9.8%
Father's Education Level	
High school (or equivalent)	37.9%
Some college/vocational school	13.6%
Bachelor's degree	13.6%
Some high school	11.4%
Master's degree or higher	7.6%
Junior high/8th grade or less	0/8%
Do not know	14.4%

enticement to encourage schools to participate in the research study, I offered to share results with each school district in the form of a brief in-service regarding environmental risk factors, adolescent females' sexual attitudes and beliefs, and prevention/intervention strategies for risky behaviors (based on the research findings specific to the female teens in each school compared to the results of the entire study). These presentations are scheduled for fall of 2007. The high school principal of each school was contacted via phone and/or email and asked to consider participation in the project (see Appendix A for sample solicitation email). Schools who wished to consider participation were forwarded details regarding the study, including the questionnaire, consent, and assent forms. Face-to-face meetings were requested by three of the schools, all three of which gave approval for participation. The fourth participating school elected to give approval for participation based on the forwarded information and a phone call.

#### *Parental Consent*

For each participating school, parents of female students between the ages of 14 and 17 were given a parental consent packet. This packet included a cover letter (Appendix B), approved by school administration, to provide evidence of the collaboration with school administration for the study. The packet also included a list of frequently asked questions (Appendix C) to address common concerns and a consent form (Appendix D). Parents were given the option to obtain more information before consenting for their daughter to participate and gave their contact information. I planned to contact these parents to discuss any concerns; however, no parents requested additional information. Students returned their parental consent forms to school personnel



designated to assist with the study. Of 285 consents distributed, 150 were returned, resulting in a 52.6% return rate.

### *Youth Assent*

The Youth Assent form and survey were introduced via a typed narrative (Appendix D) read aloud to potential participants. Participants were reassured that their survey responses would remain anonymous, that they could choose not to answer any questions which make them feel uncomfortable, that participation would in no way affect their class grades, and that they could choose to withdraw from participation at any time. Participants were also encouraged to take breaks as needed. The Youth Assent form (Appendix E) included detailed information regarding participation guidelines, benefits, risks, and participant rights. In order to insure confidentiality and anonymity for the participants, the Youth Assent forms were stored separately from the completed questionnaires. All students presented with Youth Assent forms provided assent and participated in the study (100% assent rate).

### *Incentives*

Two incentives for subject participation were offered in raffle format. Parents residing in each school district, who returned their consent form, (regardless of whether they gave consent or not) were entered in a raffle for \$20.00, resulting in one parent incentive awarded for each participating school district. Additionally, student participants from each school district were entered in a raffle for \$20.00, resulting in one participant incentive awarded for each school district. Incentive payments were made with cashier's checks and awarded in late November 2006.

### *Setting & Apparatus*

After obtaining parental/guardian consent, students eligible for participation were convened during a nonacademic time (i.e. study hall or physical education class) at each school to discuss participation in the study. Data was collected in a conference room-type setting. Participants were allowed breaks as needed. An audiotape of the assessment packet (including the Youth Assent form) and cassette players with headphones were available. One student took advantage of this tool, completing her questionnaire separately in the counselor's office.

### *Procedures*

In order to ensure anonymity for the participants, the Youth Assent form was removed from the assessment packet and kept separate from the data collected. Participants created a unique identification number based on initials from their first name, mother's maiden name, city, and their month of birth, which identified each questionnaire packet. Students' names were not on any of the questionnaires. Participants then completed the questionnaire packet. Due to the nature of the study, participants might have felt some mild discomfort from reading and responding to some items on the questionnaires; however, these were deemed to not be any greater than what they might experience in class or other typical adolescent activities, such as watching music videos, dating, or talking with peers. Because some participants may have been reminded of traumatic events, a list of relevant Participant Resources (Appendix F) was distributed to all research participants.

### *Design & Analysis*

The investigation utilized a survey design to test the hypotheses. A questionnaire format was utilized to provide more confidentiality than an interview format (Romer et al., 1997; Turner, et al., 1992; Turner et al., 1998). Analysis included descriptive statistics such as reported frequencies of relationships and sex-related behaviors.

Following data collection, structural equation modeling was applied. Structural equation modeling (SEM) is a statistical methodology that takes a hypothesis-testing approach to the multivariate analysis of a structural theory bearing on some phenomenon (Byrne, 1994). Byrne (1994) clarifies that SEM conveys two important aspects: 1) that the causal processes under study are represented by a series of structural equations, and 2) that these structural relations can be modeled pictorially to enable a clearer conceptualization of the theory under study. Thus, an entire model can be tested statistically to determine the extent to which it is consistent with the data (Byrne, 1994). In other words, if the goodness of fit of the model is adequate, arguments can be made in favor of the postulated relations among the variables; however, if the goodness of fit model is inadequate, the relationships between the variables is tenuous (Byrne, 1994). Because the current study examined the relationships between several variables in hopes of demonstrating causal pathways, SEM seemed the most appropriate methodology. Additionally, SEM provided the route to assess which model fit the data better in order to determine whether the hypothesized best-fitting model, which included attitudes as a mediating factor, was the model of best fit. SEM was chosen over other multivariate procedures for several reasons: it is confirmatory, rather than exploratory, and SEM provides explicit error estimates (Byrne, 1994). Error estimates are especially important

in a mediation model because the presence of measurement error in the mediator tends to produce an underestimate of the effect of the mediator and an overestimate of the effect of the independent variable on the dependent variable (Baron & Kenny, 1986). Due to the error estimation of SEM, the likelihood of identifying any true existing mediating effects of attitudes between sexual risk factors and risky sexual behaviors is increased.

Additionally, SEM procedures can incorporate both latent and observed variables, which were measured in the current study (Byrne, 1994).

A measurement model was produced prior to examining differences between the three models of comparison (see Figure 2). First, a path diagram was created which included all the measured variables, but without the pathways connecting the predictor variables to attitudes, predictor variables to outcomes, or attitudes to outcomes. A Wald test conducted on this data revealed 13 parameters for possible exclusion. According to Byrne (1994) the Wald Test ascertains whether sets of parameters, specified as free in the model, could in fact be simultaneously set to zero without substantial loss in model fit. In other words, the Wald Test identifies redundant structural paths in the model (Byrne, 1994). Manipulating different combinations of variable exclusions resulted in a measurement model in which six additional variables were excluded, giving the measurement model a significantly stronger chi-square goodness of fit statistic than the originally proposed model (see Table 2). Specifically, family form, socio-economic status, and mother's education were eliminated from the predictor variables; the support for healthy attitudes scale was eliminated from the AARDR measurement of attitude as a construct; and ever having had an STD or been pregnant were eliminated from the outcomes.

Figure 2. Measurement Model (\* =  $p < .05$ )

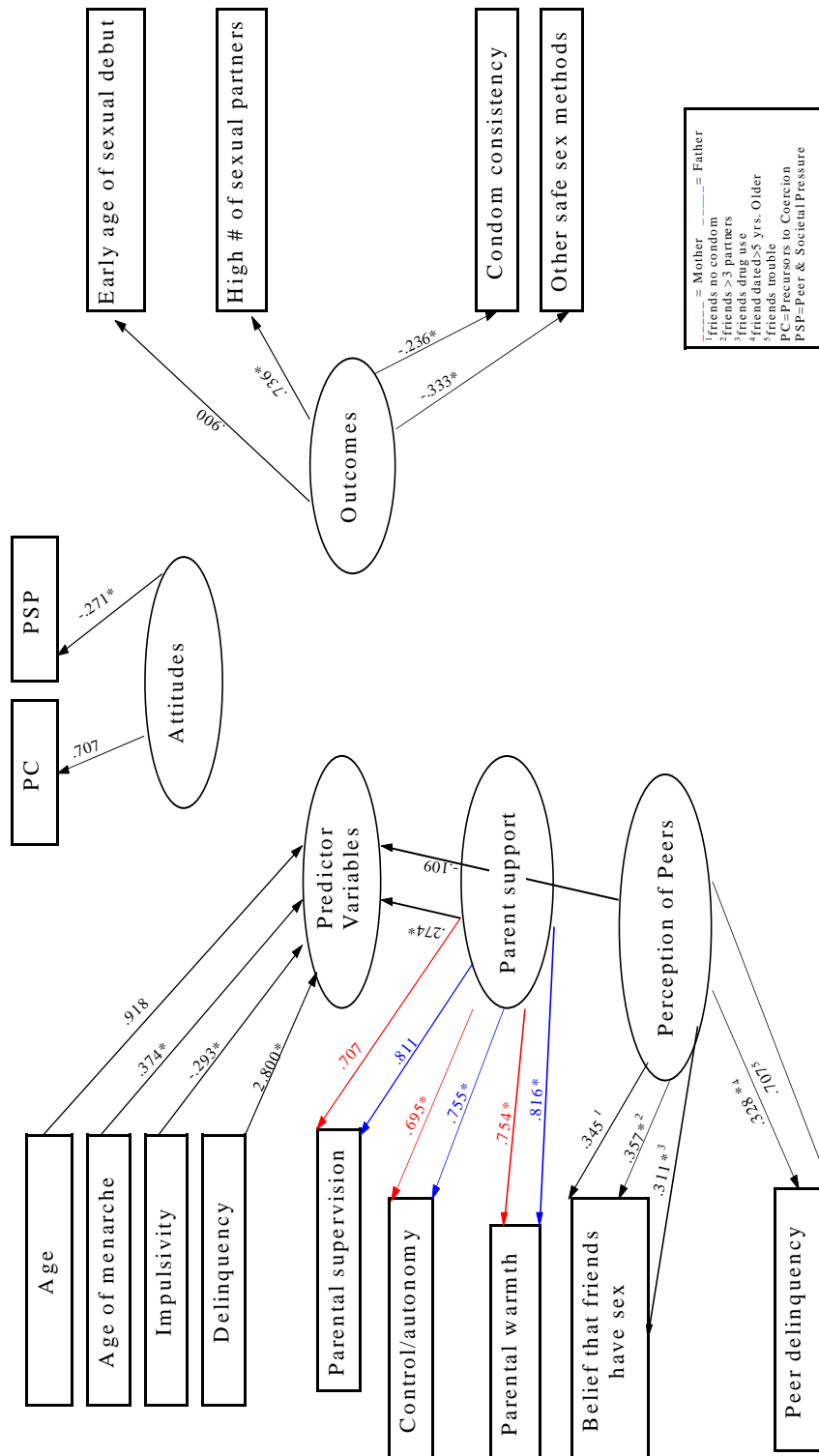


Table 2.  $X^2$  Differences Between Models

Model	$X^2$	df	$X^2$ difference
Saturated Model	1883.54	343	
Measurement Model	858.384	169	From saturated model 1025.16/174 df
Model #1	1038.31	168	From measurement model -179.93/1 df
Model #2	368.993	16	From measurement model 819.39/153 df *
Model #3	1032.93	205	From measurement model -174.55/-36 df

\*significance at  $p < .01$  level

Testing the mediation affects of attitudes on the outcome variables, rather than solely comparing the goodness of fit data, was planned and reasons underlying the appropriateness of this statistical measure for this study are included. To statistically identify a variable as having mediation effects, that variable may be considered a mediator to the extent to which it carries the influence of a given independent variable to a given dependent variable (Preacher & Hayes, 2004). Preacher and Hayes (2004) note that mediation can be said to occur when the independent variable significantly affects the mediator, the independent variable significantly affects the dependent variable in the absence of the mediator, the mediator has a significant unique effect on the dependent variable, and the effect of the independent variable on the dependent variable shrinks upon the addition of the mediator model. Specifically applied to the current study's

hypothesis, it was be hypothesized that more risk factors would be related to greater risky sexual behaviors. More unhealthy relationship attitudes would also be expected to be related to greater risky sexual behaviors. When the variable of attitude is added to the structural equation model of risk factors to risky sexual behaviors, the direct relationship between those two latent variables should weaken. Baron and Kenny (1986) define a mediator as “a third variable that represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest” (p.1173). In other words, mediation indicates that an initial variable (usually intervention) causes a change in an outcome variable (such as condom use) by exerting influence through various mediating variables (e.g. attitudes toward condom use; Salazar et al., 2005). More simply put, mediation denotes the ability of a mediating variable to explain the relation between two other related variables (Baron & Kenny, 1986). This differs from a moderating variable that “partitions a focal independent variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable” (Baron & Kenny, 1986, p.1173). Therefore, a moderator is a qualitative or quantitative variable that affects the direction and/or strength of the relation between a predictor variable and a criterion variable (Baron & Kenny, 1986). Applied to the current study, it is believed that mediation indicates that individual/environmental risk factors cause a change in high-risk sexual behaviors by exerting influence through sexual/relationship attitudes. A mediating variable is described as meeting the following conditions: 1) variations in levels of the independent variable significantly account for variations in the presumed mediator; 2) variations in the mediator significantly account for variations in the dependent variable; and 3) when both these pathways are partialled

out, a previously significant relation between the independent and dependent variables is no longer significant (Baron & Kenny, 1986). Because of the complexity of sexual behaviors, several causes of the outcomes are present; therefore, reducing the relationship between the independent and dependent variables to zero is unrealistic, but reducing it significantly can demonstrate mediating effects. Although both mediating and moderating variables measure how much the criterion variable is impacted by the third variable (attitudes in the current study), mediation is more concerned with the mechanism than in the exogenous variable itself (i.e. the impact of attitudes on changing risky sexual behaviors), whereas moderation is more concerned with the relationship between the predictor and criterion variables (i.e. between environmental risk factors and risky sexual behaviors; Baron & Kenny, 1986). Conceptually, mediators represent *properties* of the person that transform the predictor variables in some way; it is hypothesized that attitudes alter participant perceptions of environmental risk factors. Another important difference between mediator and moderator variables is that moderator variables are typically introduced when there is an unexpectedly weak or inconsistent relationship between the predictor and criterion variables, while mediator variables are typically introduced when there is a strong and consistent relationship between the predictor and criterion variables (Baron & Kenny, 1986). In the current study, predictor variables for the models were chosen based on a thorough literature review on the strength of the relationships between environmental risk factors and risky sexual behaviors. Environmental risk factors, such as depression, for which research was inconsistent or demonstrated a weaker relationship to risky sexual behaviors, were intentionally left out of the models. Finally, an operational distinction between mediator and moderator variables can be made. Baron and Kenny



(1986) note that moderator interpretation of the relation between the stressor and control typically entails an experimental manipulation of control as a means of establishing independence between the stressor and control as a feature of the environment separate from the stressor. The use of experimental design is distinctly different from a mediator model in which the control construct is only secondarily concerned with the independent manipulation of control; the essential feature of the hypothesis in a mediation model is that the third variable is the mechanism through which the stressor affects the outcome variable (Baron & Kenny, 1986).

Structural equation modeling was used to examine the differences between three models in order to specifically identify the mediating effect of attitude on other variables. Independent or predictor variables included the individual, familial, and extra-familial risk factors for risky sexual behaviors. The dependent or criterion variables included the risky sexual behavior outcomes and the mediating variables were participants' attitudes regarding sexual behaviors. Model #1 (Figure 3) examined the direct pathway between the predictor variables (age, age of menarche, impulsivity, delinquency, family form, socio-economic status, mother's education level, parent support, and peer perceptions) and four risky sexual behavior outcomes. The risky sexual behavior outcomes were operationalized as: (1) early age at first sexual experience with the cutoff age of 16 based on prior studies (Lanctot & Smith, 2001; Smith, 1997; Woodward and Ferguson, 1999); (2) having had a sexually transmitted disease (STD) or pregnancy; (3) high number of sexual partners with the cutoff at five or more partners prior to age 18; and (4) a low frequency of contraceptive use, defined as those who responded that they do not use

Figure 3. Model #1: Path Diagram between Environmental Risk Factors and Risky Sexual Behavior Outcomes (\* =  $p < .05$ )

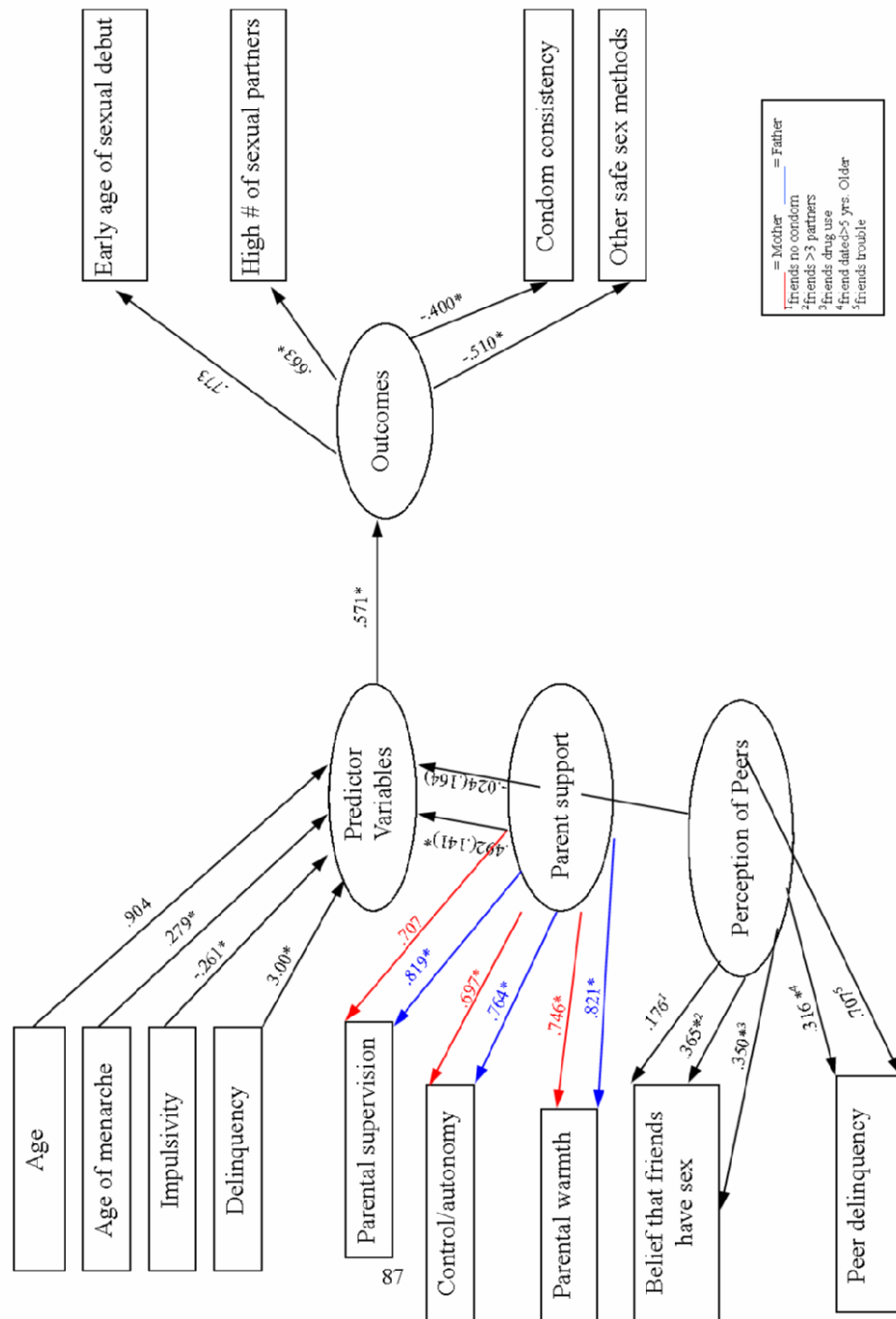


Table 3. Correlations of SEM Model #1 Variables

	Age	Menarche	FirstSex	NumPrtnr	CndmFreq	SafeSex	PN199	PN200	PN201	PN202	PN203
<b>Age</b>	1.0										
<b>Menarche</b>	.204 $\Phi$	1.0									
<b>FirstSex</b>	.370 $\Phi$	.108 $\Phi$	1.0								
<b>NumPrtnr</b>	.317 $\Phi$	.093 $\Phi$	.512 $\Phi$	1.0							
<b>CndmFreq</b>	-.192	-.056	-.309	-.265	1.0						
<b>SafeSex</b>	-.244	-.071	-.394	-.338	.204	1.0					
<b>PN199</b>	.001	.000	.000	.000	.000	.000	1.0				
<b>PN200</b>	.001	.000	.001	.001	.000	.000	.064	1.0			
<b>PN201</b>	.001	.000	.001	.000	.000	.000	.061	.128	1.0		
<b>PN202</b>	.001	.000	.001	.000	.000	.000	.056	.115	.110	1.0	
<b>PN203</b>	.002	.001	.001	.001	-.001	-.001	.124	.258	.247	.224	1.0

Menarche = age of first menstruation; FirstSex = age of sexual initiation; NumPrtnr = number of different sexual partners; CndmFreq = condom use consistency; SafeSex = non-condom contraception consistency; PN199 = friends do not use contraception consistently; PN200 = friends have had more than 3 different sexual partners; PN201 = friends use illegal drugs; PN202 = friends have dated someone 5 years their elder; PN203 = friends seem to get in trouble a lot;  $\Phi$  Pearson's correlations

Table 3. Correlations of SEM Model #1 Variables (continued)

	Age	Menarche	FirstSex	NumPrtnr	CndmFreq	SafeSex	PN199	PN200	PN201	PN202	PN203
<b>TPOPMI</b>	-.049	-.015	-.024	-.021	.012	.016	.000	.000	.000	.000	.000
<b>TPOPMA</b>	-.049	-.015	-.024	-.020	.012	.016	.000	.000	.000	.000	.000
<b>TPOPMW</b>	-.052	-.016	-.025	-.022	.013	.017	.000	.000	.000	.000	.000
<b>TPOPFW</b>	-.057	-.018	-.028	-.024	.014	.018	.000	.000	.000	.000	.000
<b>TPOPFI</b>	-.057	-.018	-.028	-.024	.014	.018	.000	.000	.000	.000	.000
<b>TPOPFA</b>	-.053	-.016	-.026	-.022	.013	.017	.000	.000	.000	.000	.000
<b>TYSRAD</b>	.019	.009	.001	.001	-.001	-.001	.000	.000	.000	.000	-.001
<b>TYSRDLN</b>	.075	-.016	.132	.113	-.069	-.087	.002	.004	.004	.003	.008
<b>PARSPT</b>	-.070	-.022	-.034	-.029	.018	.022	.000	.000	.000	.000	.000
<b>PEERPC</b>	.003	.001	.002	.001	-.001	-.001	.176	.365	.350	.316	.707
<b>PREDICT</b>	.839	.245	.441	.378	-.228	-.291	.001	.001	.001	.001	.003
<b>OUTCOMES</b>	.478	.140	.773	.663	-.400	-.510	.000	.001	.001	.001	.001

TPOPMI = Mother supervision; TPOPMA = Mother support of autonomy; TPOPMW = Mother warmth; TPOPFI = Father supervision; TPOPFA = Father support of autonomy; TPOPFW = Father warmth; TYSRAD = impulsivity; TYSRDLN = delinquency; PARSPT = parent support; PEERPC = perception of peers; PREDICT = predictor variables; OUTCOMES = dependent variables

Table 3. Correlations of SEM Model #1 Variables (continued)

	TPOPMI	TPOPMA	TPOPMW	TPOPFW	TPOPFI	TPOPEA	TYSRAD	TYSRDLN	PARSPT	PEERPC	PREDICT	OUTCOMES
<b>TPOPMI</b>	1.0											
<b>TPOPMA</b>	.493	1.0										
<b>TPOPMW</b>	.537	.519	1.0									
<b>TPOPFW</b>	.580	.572	.612	1.0								
<b>TPOPFI</b>	.579	.571	.611	.672	1.0							
<b>TPOPEA</b>	.540	.532	.570	.627	.626	1.0						
<b>TYSRAD</b>	.014	.014	.015	.017	.017	.015	1.0					
<b>TYSRDLN</b>	-.164	-.161	-.173	-.190	-.190	-.177	.712	1.0				
<b>PARSPT</b>	.707	.697	.746	.821	.819	.764	.020	-.232	1.0			
<b>PEERPC</b>	.000	.000	.000	.000	.000	.000	-.001	.011	.000	1.0		
<b>PREDICT</b>	-.055	-.054	-.058	-.063	-.063	-.059	.002	.300	-.077	.004	1.0	
<b>OUTCOMES</b>	-.031	-.031	-.033	-.036	-.036	-.034	.001	.171	-.044	.002	.571	1.0

contraception consistently. Table 3 lists the correlations of the SEM Model #1 variables. Model #2 (Figure 4) examined the direct pathway between relationship/sexual attitudes, as measured by the AARDR (Davidson, 2005) and the risky sexual behavior outcomes. Correlations of the Model #2 variables can be found in Table 4. Model #3 (Figure 5) examined the indirect pathway between the aforementioned predictor variables and sexual behavior outcomes, as mediated by attitudes. Correlations between the Model #3 variables are details in Table 5. It was hypothesized that attitudes regarding sexual behaviors and relationships are a significant mediating factor between environment/individual risk factors and risky sexual behavior outcomes.

### *Instruments*

Participants provided responses to a demographic questionnaire, combined as one packet (see Appendix J), taking approximately 45-60 minutes to complete, with items selected from the Youth Self-Report (Achenbach, 1991), the Adolescent Attitudes Regarding Dating Relationships Scale (AARDR; Davidson, 2005), the Balanced Inventory of Desirable Responding-Impression Management Subscale (BIDR-IM; Paulhus, 1991), and the Perception of Parents scales (Robbins, 1994). In addition to responding to these established scales, participants completed items to assess the presence and severity of individual and environmental risk factors for risky sexual behaviors in order to identify the participants' sexual behaviors and perceptions of peer behaviors.

*Demographic questionnaire.* The demographic questionnaire consisted of 17 items and required participants to choose responses in checklist formats to indicate each

Figure 4. Model #2: Path Diagram between Attitudes and Risky Sexual Behavior Outcomes (\* =  $p < .05$ )

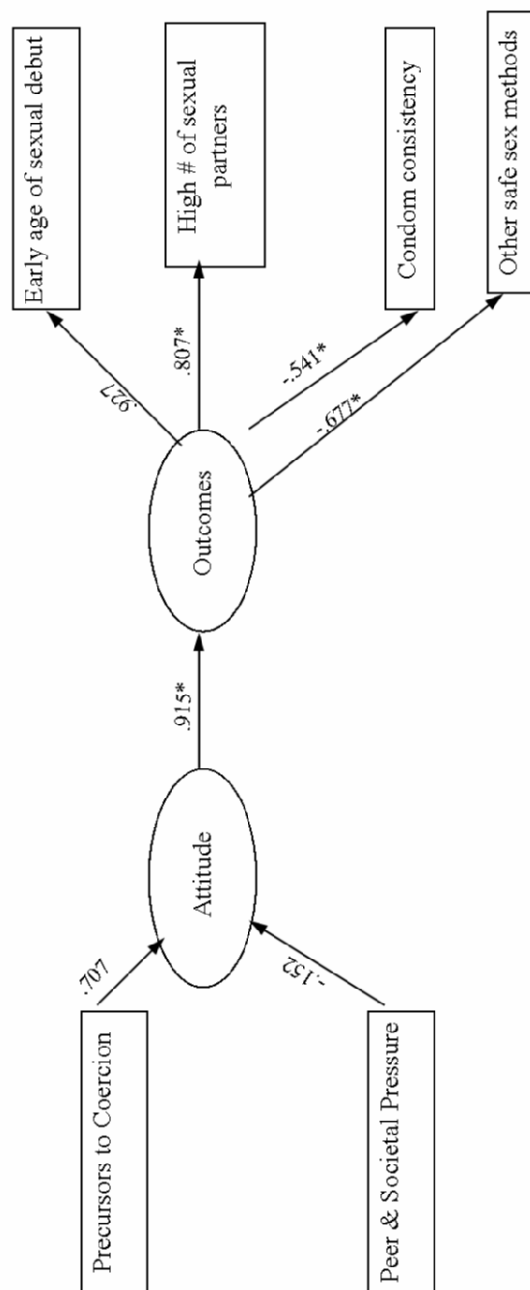


Table 4. Correlations of SEM Model #2 Variables

	<b>FirstSex</b>	<b>NumPrtnr</b>	<b>CndmFreq</b>	<b>SafeSex</b>	<b>TAPC</b>	<b>TAPSP</b>	<b>OUTCOMES</b>	<b>ATTITUDE</b>
<b>FirstSex</b>	1.0							
<b>NumPrtnr</b>	.748 <sup>†</sup>	1.0						
<b>CndmFreq</b>	-.502	-.437	1.0					
<b>SafeSex</b>	-.627	-.546	.366	1.0				
<b>TAPC</b>	.600	.522	-.350	-.438	1.0			
<b>TAPSP</b>	-.129	-.112	.075	.094	-.108	1.0		
<b>OUTCOMES</b>	.927	.807	-.541	-.677	.647	-.139	1.0	
<b>ATTITUDE</b>	.848	.738	-.495	-.619	.707	-.152	.915	1.0

TAPC = Precursors to Coercion scale on AARDR; TPSP = Peer & Societal Pressure scale on AARDR



Figure 5. Model #3: Path Diagram between Environmental Risk Factors and Risky Sexual Behavior Outcomes, With Attitudes as a Mediating Factor (\* =  $p < .05$ )

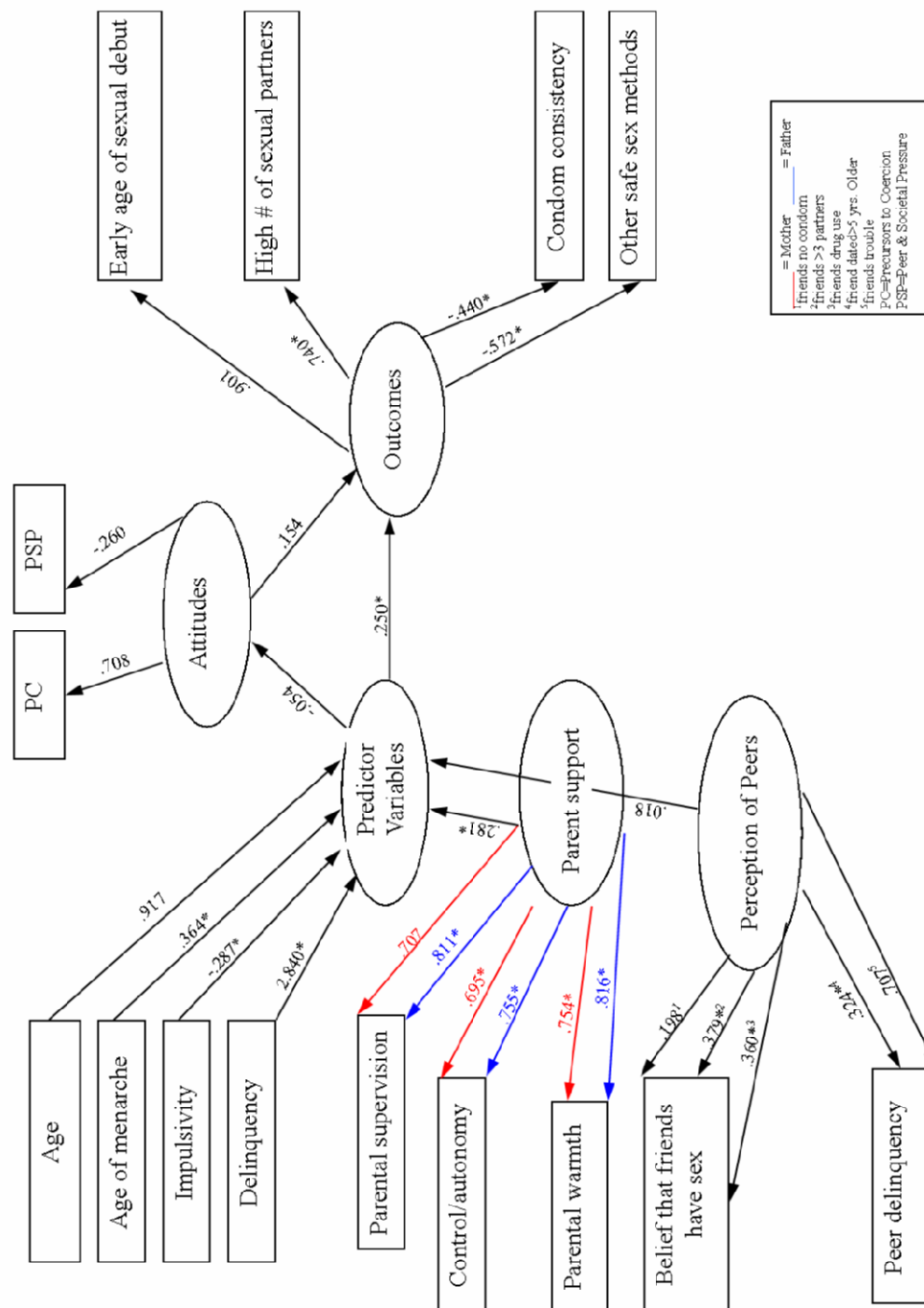


Table 5. Correlations of SEM Model #3 Variables

	Age	Menarche	FirstSex	NumPrtnr	CndmFreq	SafeSex	PN199	PN200	PN201	PN202	PN203
<b>Age</b>	1.0										
<b>Menarche</b>	.271 $\Phi$	1.0									
<b>FirstSex</b>	.198 $\Phi$	.075 $\Phi$	1.0								
<b>NumPrtnr</b>	.162 $\Phi$	.061 $\Phi$	.666 $\Phi$	1.0							
<b>CndmFreq</b>	-.096	-.037	-.396	-.325	1.0						
<b>SafeSex</b>	-.125	-.047	-.515	-.423	.251	1.0					
<b>PN199</b>	.001	.000	.000	.000	.000	.001	1.0				
<b>PN200</b>	.002	.001	.000	.000	.000	.002	.000	1.0			
<b>PN201</b>	.002	.001	.000	.000	.000	.002	.001	.000	1.0		
<b>PN202</b>	.001	.001	.000	.000	.000	.001	.001	.000	.000	1.0	
<b>PN203</b>	.003	.001	.001	.001	.000	.003	.001	.001	.000	.000	1.0

Table 5. Correlations of SEM Model #3 Variables (continued)

	Age	Menarche	FirstSex	NumPrtnr	CndmFreq	SafeSex	PN199	PN200	PN201	PN202	PN203
<b>TPOPMI</b>	-.049	-.019	-.012	-.010	.006	.008	.000	.000	.000	.000	.000
<b>TPOPMA</b>	-.048	-.019	-.012	-.010	.006	.008	.000	.000	.000	.000	.000
<b>TPOPMW</b>	-.052	-.021	-.013	-.011	.006	.008	.000	.000	.000	.000	.000
<b>TPOPFW</b>	-.056	-.022	-.014	-.012	.007	.009	.000	.000	.000	.000	.000
<b>TPOPEI</b>	-.056	-.022	-.014	-.012	.007	.009	.000	.000	.000	.000	.000
<b>TPOPEA</b>	-.052	-.021	-.013	-.011	.006	.008	.000	.000	.000	.000	.000
<b>TAPC</b>	-.032	-.012	-.107	-.088	.052	.068	.000	.000	.000	.000	.000
<b>TAPSP</b>	.012	.005	-.039	.032	-.019	-.025	.000	.000	.000	.000	.000
<b>TYSRAD</b>	.017	.011	-.001	-.001	.000	.000	.000	-.001	.000	.000	-.001
<b>TYSRDLN</b>	.034	-.030	.056	.046	-.027	-.036	.003	.005	.005	.004	.010
<b>PARSPT</b>	-.069	-.027	-.018	-.014	.009	.011	.000	.000	.000	.000	.000
<b>PEERPC</b>	.004	.002	.001	.001	-.001	-.001	.198	.379	.360	.324	.707
<b>PREDICT</b>	.850	.322	.232	.191	-.113	-.147	.001	.002	.002	.002	.003
<b>OUTCOMES</b>	.219	.083	.901	.740	-.440	-.572	.000	.000	.000	.000	.001
<b>ATTITUDE</b>	-.046	-.017	-.151	-.124	.074	.096	.000	.000	.000	.000	.000

ATTITUDE = factor measuring attitudes through AARDR scale

Table 5. Correlations of SEM Model #3 Variables (continued)

	TPOPMI	TPOPMA	TPOPMW	TPOPFW	TPOPEFI	TPOPEFA	TAPC	TAPSP	TYSRAD	TYSRDLN	PARSPT	PEERPC
<b>TPOPMI</b>	1.0											
<b>TPOPMA</b>	.491	1.0										
<b>TPOPMW</b>	.533	.524	1.0									
<b>TPOPFW</b>	.577	.567	.615	1.0								
<b>TPOPEFI</b>	.574	.564	.611	.662	1.0							
<b>TPOPEFA</b>	.534	.525	.569	.616	.612	1.0						
<b>TAPC</b>	.002	.002	.002	.002	.002	.002	1.0					
<b>TAPSP</b>	-.001	-.001	-.001	-.001	-.001	-.001	-.184	1.0				
<b>TYSRAD</b>	.015	.015	.016	.018	.018	.016	.000	.000	1.0			
<b>TYSRDLN</b>	-.151	-.149	-.161	-.175	-.174	-.162	-.009	.003	.739	1.0		
<b>PARSPT</b>	.707	.695	.754	.816	.811	.7555	.003	-.001	.022	-.214	1.0	
<b>PEERPC</b>	.000	.000	.000	.000	.000	.000	.000	.000	-.001	.014	.000	1.0



participant's age, year in school, racial or ethnic background, whether they immigrated to the United States in the last five years, eligibility for free or reduced lunches at school current family structure, and the highest level of education achieved by their mothers and fathers. In order to specify family form, because family members can change throughout childhood, subjects were asked to identify their dominant family structure as the teenager was growing up, which is hypothesized to have had the most developmental influence. Education levels were modeled after Nelson and Keith's study (1990) designed to ask participants whether their parents had obtained an education at the junior high school/8<sup>th</sup> grade level or less, some high school, finished high school or received GED, some college or vocational/technical school, finished a four-year college, earned a master's or professional degree, or whether participants did not know this information.

*Sexual activity.* Additional demographic items were used to identify participants' sexual behaviors. As suggested by several researchers, these items included detailed explanations of sexual terms and framed sexual questions using non-judgmental and developmentally appropriate wording in hopes of reducing self-preservation bias (Hearn, et al., 2003; Romer et al., 1997). As noted in Sieving et al.'s (2005) research on teens' self-reports of sexual behaviors, higher reliability may be obtained by asking participants to choose from meaningful response categories (e.g., once, less than once a month, 1-3 times per month, more than 3 times per month) rather than to provide an exact number. This suggestion was followed as much as possible. Female teens were asked age of menarche, age of first consensual sexual intercourse, and whether they have had an STD or pregnancy. Participants were also asked their total number of sex partners and frequency of contraception use. Having had more than five sex partners by age 18 was

considered a “high” number of partners. When looking at assessment of sexual activity, Whitaker, Miller, and Clark 2000 recommend to not use a dichotomous variable. Rather, Whitaker and colleagues (2000) recommend that sexual activity be classified into categories of delayers, anticipators, singles and multiples. Delayers are described as those teens who do not foresee themselves becoming sexually active in the upcoming year, anticipators are those who do foresee themselves becoming sexually active in the upcoming year, singles as those who are sexually active with only one partner, and multiples defined as those teens who are sexually active with more than one partner (Whitaker et al., 2000). This suggestion was followed. The definition of sexual activity was explained as: “Having sex means the male’s penis is inside the female’s vagina. Sometimes it is also called ‘going all the way,’ or ‘doing it’” (Rose et al., 2005). Amount of sexual activity was measured in this fashion.

Regarding the use of condoms, participants were asked if they had vaginal sex in the past six months. Those who responded affirmatively were then asked if condoms were used “always”, “sometimes”, or “never”. Previous researchers used these descriptors, then collapsed “always” versus “never” and “sometimes” into two categories to differentiate those participants who engage in safer sex consistently and those who do not (Gowen, et al., 2004).

A six-month referent was utilized in this study because a six-month reference may be more likely than a three-month (or shorter) referent, to capture behaviors that are episodic in nature, and therefore may provide a more accurate picture of sexually active adolescents’ behavior over time (McFarlane & St. Lawrence, 1999). Sieving et al.’s (2005) findings suggest that sexually experienced 13 to 18 year old girls can provide

reliable reports of number of sexual partners and duration of hormonal contraceptive use in the past six months. Participants were given calendars to use as a visual aid.

*Peer perceptions.* Evidence suggests that sexual activity among adolescents is strongly influenced by others, particularly their friends (Blum & Mmari, 2005; Davis & Harris, 1982; Low, 2005). Perceptions of peer activities were assessed with five demographic items created from Dilorio and colleagues' (1993) suggestions regarding peer norm influences on sexual behavior. Participants were asked to respond "true," "false," or "don't know" regarding their perceptions of their peers' involvement in risky practices, such as having sex without a condom, having multiple sex partners (defined as more than three), and using illicit substances (Benda & DiBlaso, 1994; Blum & Mmari, 2005; Hayes, 1987; Whitbeck et al., 1992). Additionally, participants indicated whether at least one of their friends has dated someone more than five years older than their friend due to Cavanaugh's (2001) assertion that a strong connection to a peer group which includes older boys is linked to increased sexual activity of the younger females in the same peer group. The final item regarding peer beliefs was based on research proposing that teens are influenced to engage in unhealthy behaviors if they perceive that their friends are also engaging in unhealthy behaviors (Black, et al., 1997; Boyer, et al., 1999; Jessor & Jessor, 1975; Millstein & Moscicki, 1995). This item asked participants whether their friends seem to get in trouble a lot.

*Adolescent Attitudes Regarding Dating Relationships Scale (AARDR).* The AARDR is composed of 90 items reflecting a continuum of attitudes regarding dating relationships, from healthy to verbally, physically, and sexually coercive aspects (Davidson, 2005). The AARDR consists of factors that include the nested systems of the



Table 6. AARDR Items in Relation to Ecological Systems Theory

Item	Micro	Meso	Exo	Macro
43. If my boyfriend really loved me, he would want to spend all of his time with me.	X			
45. It is a sign of caring when a guy insists on knowing where his girlfriend is at every moment.	X			
47. When a boyfriend is jealous, it means he cares about the relationship.	X			
49. Most parents have talked to their teenagers about healthy dating relationships.		X		
55. It is OK for a boy's girlfriend to tell him which girls he can and cannot talk to.	X			
57. It is normal for a girl's boyfriend to want to know where she is at all times.	X			
59. Guys pressure their guy friends into being sexually active.		X		
61. The old double standard still exists—guys who have sex are seen as studs, girls who have sex are seen as sluts.				X
64. In movies, girls are shown as wanting to be forced into sex.			X	
66. The peer pressure to <u>not</u> be a virgin is very strong.		X		
69. Guys getting a little physically rough with girls is just a normal part of dating relationships.	X			
70. Scoring with as many girls as possible makes guys more popular.				X
78. Music videos show girls wanting to be forced into sex.			X	
79. It seems like everywhere I look, I am being given messages to have sex.			X	
86. Wanting to know your boyfriend's class and work schedules is just a normal part of relationships.			X	

Table 6. AARDR Items in Relation to Ecological Systems Theory

Item	Micro	Meso	Exo	Macro
91. It is OK for a guy to ask his friends to keep tabs (keep track of, keep an eye out) on his girlfriend.	X			
92. The lyrics of today's songs make me feel like everyone is sexually active.			X	
105. My family has instilled values in me about dating relationships and sexual behavior.		X		
114. When I hang out with my friends, we often talk about sexual things like making out, hooking up, having sex, etc.		X		
117. It is OK for a girl to ask her friends to keep tabs (keep track of, keep an eye out) on her boyfriend.	X			
119. When a guy gets jealous when his girlfriend is talking to another guy, it shows he really likes her.	X			
120. If a guy really likes you, he will always want to be touching you.	X			
124. My teachers have taught me to respect myself and my body.		X		
126. Guys threaten to break up with girls if girls don't do sexual things with them.	X			
133. Most teens think about what their parents have taught them when in a sexual situation.		X		
136. Girls hook up with guys so they won't get teased by guys.	X			

ecological systems model including individual level, microsystem level, exosystem level, and macrosystem level (see Table 6).

An example of an item informed by the individual level is “I believe that girls always say ‘no’ to sex and that a guy’s role is to change their minds.” At the mesosystem level, an example item is “Most teens think about what their parents have taught them when in a sexual situation.” At the exosystem level, an example is “Movies show girls wanting to be forced into sex.” At the broadest level, the macrosystem, an example item is, “The old double standard still exists—guys who have sex are seen as studs, girls who have sex are seen as sluts.” Davidson’s (2005) factor analysis of the AARDR indicates that each level of the ecological model is represented in the AARDR (female version). Three factors, expressed as subscales, were explored: Precursors to Coercion (PC), Peer and Societal Pressure (PSP), and Support for Healthy Attitudes (SHA). Low correlations were found between the three factors, indicating that each measures a separate construct. Items on each of the scales were listed in random order and were phrased both positively and negatively (approximately half) to offset any potential response bias (Davidson, 2005). Additionally, five items were included to measure participants’ validity in truthfully completing the AARDR (e.g., “I am reading each of these items carefully,” and “Please answer ‘2’ for this item”). Responses were answered using a 6-point Likert-type format (i.e. 1 = Strongly Agree to 6 = Strongly Disagree). No midpoint was utilized. To score the AARDR, negatively worded items were reverse scored and then all item scores were summed (Davidson, 2005). Higher scores indicate more positive attitudes regarding dating relationships (Davidson, 2005). As this measure is newly designed, early psychometric properties are based solely on Davidson’s study. The properties include low

correlations with the BIDR-IM score (the social desirability scale) providing evidence for discriminant validity and high statistically significant total test-retest reliability ( $r = .81$ ) over a two-week time period (Davidson, 2005). Davidson (2005) cites Cronbach's alpha internal consistency estimates for the female AARDR total scale at .67.

*Balanced Inventory of Desirable Responding (BIDR).* As a measure of discriminant validity and to assess social desirability, the BIDR was administered to all participants. The full version of the BIDR consists of 40 items that measures two constructs: (a) Self-Deceptive Positivity, which is the tendency to give self-reports that are honest but positively biased ("faking good") and (b) Impression Management, which is the deliberate self-presentation to an audience (Paulhus, 1984). The Impression Management (IM) subscale, used for the current study, is comprised of 20 items that are stated as propositions (Paulhus, 1984). IM subscale scores have been found to be positively related to scores on lie scales and the Marlowe-Crowne Social Desirability Scale (see Paulhus, 1991 for a review). Internal consistency (coefficient alphas) for the IM subscale scores ranged from .75 to .86 in previous studies. Test-retest reliability correlation was found to be .65 (Paulhus, 1984). Respondents rated their degree of agreement to each item based on a 7-point Likert-type scale ranging from 0 (not true) to 3 (somewhat true) to 6 (very true). Half of the items are written in a positive direction and the other in a negative direction. After reverse scoring the negatively phrased items, it is recommended that one point for each extreme response (i.e., 5 or 6) be added to assess truly exaggerated desirable responses (Paulhus, 1991). Therefore, participants were scored one point for each item to which they responded a 5 or 6 and responses below 5 or 6 were not scored. The total possible score on the Impression Management subscale ranges from 0 to 20

with higher scores indicating higher levels of responding in a socially desirable manner. Paulhus (1984) found mean scores of a college student sample for the IM subscale to be 4.3 (SD = 3.1) for males and 4.9 (SD = 3.2) for females. Participant responses scoring more than one standard deviation above this mean were considered invalid and were discarded from the study (i.e. scores of 9 or higher).

*Youth Self-Report Scales (YSR).* Items from the Youth Self-Report Scale (Achenbach, 1991; Achenbach & Rescorla, 2001) were administered to participants to provide measures of substance use and delinquency (rule-breaking behavior subscale) and impulsivity (attention problems subscale). The YSR was designed to be completed by youths (ages 11-18) to describe their own functioning (Achenbach & Rescorla, 2001). The YSR consists of 118 behavior problem items and requires respondents to use a 3-point Likert scale with 0 = “not true of me,” 1 = “somewhat true of me,” and 2 = “very true of me” (Achenbach, 1991). The YSR yields a total behavior problems score as well as internalizing and externalizing foci; however, the rule-breaking behavior and attention problems subscales were only used in the current study for the specified variables. Typically, in clinical application, scale raw scores are converted to adjusted T-scores for comparison to normative samples with T-scores higher than 70 reflecting clinically significant problems, while T-scores between 67 and 70 indicate borderline clinical intervention range (Achenbach & Rescorla, 2001). For comparison purposes in the current study, mean raw scores were calculated for each of the subscales due to possible floor effects of T-scores. Therefore, mean raw scores for the rule-breaking behavior and attention problems subscales were calculated to factor into the latent variable, risk-taking behavior—an individual risk factor for high-risk sexual behaviors. Sound psychometric

properties have been identified for the YSR. Achenbach and Rescorla (2001) cite an overall intra-class correlation coefficient (ICC) of 0.95 for the 118 specific problem items ( $p < .001$ ) for test-retest reliability. Specifically, the test-retest reliability of the rule-breaking subscale has been noted at 0.83 and for the attention problems subscale at 0.87 (Achenbach and Rescorla, 2001). Additionally, scale score stability has been measured by Pearson correlation over a seven-month interval and noted to be significant at 0.56 and 0.63 for the attention problems and rule-breaking behaviors subscales, respectively ( $p < .05$ ; Achenbach & Rescorla, 2001). Achenbach and Rescorla (2001) boast strong content validity of the problem item scores as “supported by four decades of research, consultation, feedback and revisions, as well as by findings that all discriminated significantly ( $p < .01$ ) between demographically matched referred and nonreferred children” (p.135). Criterion-related validity has been supported by multiple regressions and discriminant analyses at  $p < .01$  significance level between referred and nonreferred children (Achenbach & Rescorla, 2001). Similarly to other validity measures, construct validity is reported to be supported by significant associations with analogous scales of other instruments, by genetic and biochemical findings, and by predictions of long-term outcomes (Achenbach & Rescorla, 2001).

*Perceptions of Parents Scales (POPS.)* The Perceptions of Parents Scales concern the degree to which parents provide what is considered an optimal parenting context (Grolnick, Deci, & Ryan, 1997; Robbins, 1994). The college-student version of the POPS is intended for use with participants who are late adolescents or older to assess children’s perceptions of their parents’ autonomy support and involvement, as well as the degree to which the children perceive that their parents provide warmth. The POPS also

has a child scale used with children as young as 8 years old; however, no resources could be found citing the upper end of the age range appropriate for the child scale. There is no scale specifically for early to late adolescents; therefore, the college-student version was deemed most appropriate due to the developmental level of the items. It was also decided that because this study examines more “adult-like” behaviors, such as sexual intercourse, participants would find the college-student version more aligned with the other items they were completing. The six subscales, Mother/Father Autonomy Support, Mother/Father Involvement, and Mother/Father Warmth, provided data for the mesosystem familial risk factors of parental supervision (involvement), psychological control/teen autonomy (autonomy support) and warmth. Twenty-one questions were presented for participants to indicate characteristics about their mothers and the same 21 items are presented for their fathers, in a Likert-type scale format of 1 to 7, with 1 being “not at all true, 4 as “somewhat true,” and 7 as “very true.” The questionnaire was designed as part of a doctoral dissertation, which provided preliminary evidence for the reliability and validity of the scale (Robbins, 1994). Robbins (1994) linked parental autonomy support to autonomy-related child outcomes, including self-esteem, self-regulation, mental health, and causality orientations. Additionally, internal consistency ranged from .75 to .85 (Cohen’s alpha) and can be used to rate either mother or father (Robbins, 1994).

Conceptually, it is helpful to identify how each of the three models would present if that particular model were supported. If model #1, the direct path between environmental risk factors and risky sexual behavior outcomes would be supported, it was expected that the relationship between total predictor variables and total criterion outcomes would be stronger than parallel relationships in models #2 (between total attitude and total

outcomes) and #3 (total predictor variables plus total attitude and total outcomes).

Similarly, if model #2, the direct path between attitudes and risky sexual behavior outcomes would be supported, it was expected that the relationship between total attitude and total outcomes would be stronger than parallel relationships in models #1 (between total predictor and criterion variables) and #3 (between total predictor variables plus total attitude and total outcomes). As expected, if model #3 would be supported, it was expected that the relationship between total predictor variables and the influence of attitudes connected to total behavior outcomes would be stronger than the parallel relationships described for models #1 and #2.



## CHAPTER FOUR: RESULTS

The overall aim of this investigation was to specify the mediating effect of sexual/relationship attitudes (as measured by the AARDR; Davidson, 2005) on sexual behaviors from environmental risk factors through the examination of three models, as well as to make statistical comparisons between the same three models regarding goodness of fit statistics. This chapter describes and summarizes the statistical analyses conducted to identify which of the three models investigated best fits the data collected and information regarding mediational testing. First, the data screening process and descriptive statistics are reported followed by results of structural equation modeling and details regarding the goodness of fit data. Additionally, post hoc analyses were conducted to further examine the possible affects of attitudes on risky sexual behaviors.

### *Data Screening*

Prior to data analysis, individual instruments were examined for validity. The BIDR-IM scale was scored and participant questionnaires with scores of 9 or higher were eliminated from the study (Paulhus, 1984, 1991). Based on this criterion, 17 questionnaires were deemed invalid and not included in the data analysis. Additionally, questionnaires with more than one incorrectly answered validity item on the AARDR were to be removed from the sample; however, no participants were excluded based solely on the AARDR validity items. One questionnaire was also excluded due to having less than 25% of the items completed. Thus, the total dataset subsequent to this data

screening included 132 female adolescents. Data was entered into SPSS (version 10.0), was checked for errors and corrected prior to analysis (Pallant, 2006).

### *Descriptive Statistics*

Several demographic questions identified risk factors for and participant experiences with sexual behaviors. Participant composition for the risk factors of age of menarche, family structure, and parents' education levels are described first

The current study arbitrarily designated the age of 9 and below of menarche as a risk factor for risky sexual behaviors, because a defined "early" age of menarche was not noted in the literature. Instead, past research consistently links earlier age of menarche to earlier sexual debut and involvement in other risky sexual behaviors, on a continuum (Blum & Mmari, 2005; Flannery et al., 1993; Hunt, 2002; Kiragu & Zabein, 1993; Magnusson, 2001; Mezzich et al., 1997; Miller et al., 1998). Most participants reached menarche at age 12 or older (63.6%) followed by 11 year olds (18.9%), 10 year olds (9.8%), and 8 or 9 year olds (5.3%). Two participants had not yet reached menarche at the time of this study and one participant did not respond to this item. Seven participants (5.3 %) in the study possessed this risk factor.

The majority of participants described their current family structure as a two-parent household (married, with no previous marriages; 43.2%). The second most common reported family structure was a two-parent household in which both parents are currently married, one of which was previously married (28.8%). These were followed by single parent households (18.9%), two-parent households, not married (2.3%), those living with relatives (not parents; 1.5%), and those living with friends (1.5%). Five participants (3.8%) indicated that none of the family structure options applied to them.

Compared to U.S. and Missouri statistics, this study population under-represents single households, as the U.S. Census Bureau (2005) cites approximately 30% of U.S. households and approximately 27% of Missouri households are run by single parents.

As previously noted, children whose parents with less than a high school degree are more likely to have initiated sexual intercourse than children whose parents graduated high school or earned an equivalency degree (Koss, 1985). These descriptive statistics indicate that approximately 7% of participants' mothers and 12% of participants' fathers meet this risk criterion. Similarly, teens whose parents have a high school education or equivalent, as compared to teens whose parents have a college level education, are seven times more likely to have initiated intercourse (Koss, 1985). In the current study, approximately 26% of participants' mothers and 38% of participants' fathers meet this criterion. More specifically, most of the participants' mothers or stepmothers either attained a high school (or equivalent) level of education (25.8%) or attended some college/vocational school (25.8%). Mothers who have earned a bachelor's degree were the next largest group (21.2%), followed by those earning at least a master's degree (9.8%), some high school education (5.3%), and junior high/8<sup>th</sup> grade education or less (1.5%). Thirteen participants (9.8%) reported not knowing their mother's highest level of education and one participant did not respond to this item. Similarly, the majority of participants' fathers or stepfathers were reported to have finished high school or earned an equivalent education (37.9%), followed by attending some college/vocational school (13.6%) and earning a bachelor's degree (13.6%). Father's reported highest level of education rounded out with 11.4% attending some high school, 7.6% earning a master's degree or higher, and 0.8% attending junior high/8<sup>th</sup> grade or less. A large number of

participants did not know their father's highest level of education (14.4%), and one participant did not respond to this item.

The reported frequencies of dating and sexual behaviors will be discussed next and are listed in Table 7. Refer to Table 8 for variable means, standard deviations, and internal consistencies.

Regarding dating relationship history, the majority of participants either reported having dated two to five individuals (39.4%) or having dated more than five people (39.4%), with the next largest group reporting having never dated (11.4%), followed by 9.8% reporting having dated only one person. In terms of current dating relationship status, the majority of respondents reported being single (41.7%), with the next largest group reporting they are dating one person exclusively (32.6%), and 18.9% of participants reporting that they are currently dating one person, but are not in a committed relationship. One participant each reported being engaged and married (0.8% each).

Female adolescents having sexual intercourse at or before age 16 is defined in the current study as a risky sexual behavior outcome and 40 participants (30.3%) met this criterion. The majority of participants reported that they have not yet participated in consensual intercourse (62.1%). This percentile represents a greater number of female teens refraining from sex as compared to U.S. and Missouri figures of 46% and 47%, respectively (CDC, 2006). The most common age at first consensual sexual intercourse was 14 (11.4% of the total participants), with the next largest group at age 15 (10.6%), followed by age 16 or older (7.6%), age 13 (4.5%), age 12 (2.3%) and age 11 or younger

Table 7. Frequencies of Reported Participant Relationship/Sexual Behaviors

Behavior	Percentile Reporting	Behavior	Percentile Reporting
Dating Relationship History		Frequency of Sexual Intercourse	
Dated 2 – 5 individuals	39.4%	Never had sexual intercourse	62.1%
Dated > 5 individuals	39.4%	> 3 times/month	12.1%
Never dated	11.4%	< 1 time/month	11.4%
Dated only 1 individual	9.8%	1-3 times/month	9.8%
		1 time only	4.5%
Current Dating Relationship Status			
Single	41.7%	Had/currently have an STD	3.0%
Dating 1 person exclusively	32.6%	Have been/currently are pregnant	3.8%
Dating 1 person, not committed	18.9%		
Engaged	0.8%	Number of Sexual Partners	
Married	0.8%	Have not had sexual intercourse but anticipate having sex in the upcoming year	56.1%
		2, 3, or 4 sexual partners	6.1%
Age of Participation in Sexual Intercourse (Consensual)		Have not had sexual intercourse & do not foresee having sex in the upcoming year	18.9%
Not participated in sexual intercourse	62.1%	1 sexual partner only	16.7%
14 years old	11.4%	5 or more sexual partners	1.5%
15 years old	10.6%		
16 years old or older	7.6%	Inconsistent Contraception Use of those Sexually Active	
		Used condoms always	65.1%
13 years old	4.5%	Used condoms seldom or never	34.8%
12 years old	2.3%	Used non-condom method always	34.8%
11 years old or younger	1.5%	Used non-condom method seldom or never	65.1%
		Overall failure to use contraception consistently	7.5%

Table 8. Variable means, standard deviations, and internal consistencies

Variable	M	SD	Internal consistency
Age*	15.12	1.75	_____
Age of menarche*	4.55	1.53	_____
Impulsivity✦	1.65	0.38	.780
Delinquency✦	1.41	0.29	.704
Parental warmth: Mother✦	5.38	1.51	.836
Parental warmth: Father✦	5.00	1.84	.875
Parental support of autonomy: Mother✦	4.58	1.40	.859
Parental support of autonomy: Father✦	4.35	1.77	.842
Parental involvement: Mother✦	5.03	1.60	.819
Parental involvement: Father✦	4.35	1.77	.773
Belief that peers have sex*	2.91	1.67	.382
Peer delinquency*	1.27	1.15	.561
Precursors to coercion+	3.92	0.86	.822
Peer and societal pressure+	3.85	0.84	.743
Early sexual debut*	1.70	2.52	_____
High number of sexual partners*	1.00	1.28	_____
Inconsistent contraception use*	4.90	1.69	_____

\*demographic questionnaire

✦ YSR

✦POP scales

+ AARDR

(1.5%). These percentages are relatively similar to recent U.S. and Missouri census data (CDC, 2006).

Frequency of sexual intercourse was also assessed with most participants reiterating that they have never had sexual intercourse (62.1%). Sixteen participants reported having sex more than three times per month (12.1%), fifteen girls reported having sex less than once a month (11.4%), thirteen reported having sex one to three times a month (9.8%), and six girls reported having sex only once (4.5%). Although intercourse frequency is not specifically utilized as a risk factor or sexual behavior outcome in the current study, obviously, the more often a teen engages in sexual activity, the more likely she will contract a sexually transmitted disease or become pregnant. Implications of sexual behavior frequency are discussed in Chapter Five.

A total of nine participants (6.9%) reported having had a sexually transmitted disease and whether they have been, or were pregnant at the time of the survey. Four participants (3.0%) reported that they have had an STD, while five girls (3.8 %) indicated that they have been, or were pregnant, at the time of the survey. None of the participants reported having had both an STD and being pregnant, so there is no overlap in the frequency of this sexual behavior outcome.

Additionally, having five or more sexual partners is considered a high-risk sexual behavior and two participants (1.5%) reported meeting this criterion. Participants indicated the number of sexual intercourse partners they have had through a checklist format with most girls indicating that they have not had sexual intercourse and do not foresee themselves being sexually active in the upcoming year (56.1%). An additional

6.1% reported not having had sex, but anticipated having sex within the next year. Those who reported having had sexual intercourse included 18.9% (25 participants) having had two, three, or four sexual partners, and 16.7% (22 participants), having only one sexual partner.

Inconsistent contraceptive use is another high-risk sexual behavior, operationalized in the current study as either having used condoms or practiced other safe sex methods within the past six months “seldom” or “never”. Approximately a third of participants (31.8%) responded positively to having had sexual intercourse within the last six months. Of those, 65.1% indicated condoms were used “always” and 34.8% indicated condoms were used “never” or “seldom.” Additionally, of those sexually active within the six months prior to survey distribution, 34.8% reported “always” practicing safe sex using a non-condom method, while 65.1% indicated they “never” or “seldom” practiced safe sex (other than condom use). Taking the overlap of responses into account, ten participants (7.5%) are failing to use contraception consistently, meeting criterion for this outcome.

As with intercourse frequency, choice of contraception was not utilized as either a risk factor or outcome in the current study; however, implications related to contraception choice are discussed in Chapter Five. Of the contraceptive choices available, 28.8% of the participants indicated using condoms the most often, with 17.4% utilizing oral contraception, 15.9% using withdrawal or “pulling out” as a birth control method, 4.5% using the rhythm method (having sex at the “safe” times of the month), 3.8% reported using Depo-Provera (the shot), 1.5% using the contraception patch (Ortho-Ovra), and 0.8% using emergency contraception (the morning after pill). No participants reported



using Norplant, an intrauterine device, a female condom, or contraceptive foam, jelly, or film, as birth control measures.

In short, 40 participants (30.3%) in the current study had consensual sexual intercourse at or before age 16. Nine participants (6.9%) reported having had a sexually transmitted disease and/or having been pregnant. Two participants (1.5%) reported having had five or more sexual partners and ten participants (7.6%) are failing to use contraception consistently. After accounting for participants who demonstrated more than one high-risk sexual behavior, approximately one-third of the total participants (45 girls, 34.1%) demonstrated at least one of the study's defined high-risk sexual behaviors. Sixteen of the total participants (12.1%) are currently demonstrating more than one risky sexual behavior. This is approximately a third of those subjects who reported meeting criteria for a high-risk sexual behavior. All participants who reported experiencing multiple high-risk sexual behaviors experienced first coitus at age 16 or earlier. Eleven participants reported demonstrating two high-risk sexual behaviors (early sexual debut plus four having been pregnant/had STD, one having five or more sexual partners, and six with inconsistent contraception use). Three participants demonstrated early sexual debut, having been pregnant/had an STD, and demonstrated inconsistent contraception use. Two girls demonstrated all four high-risk sexual behaviors.

### *Structural Equation Modeling*

Based on ecological systems theory, three models were constructed using EQS 6.1 software (Bentler, 1995). Structural equation modeling was used to examine which of the three models best fit the data collected. This analytic approach allows one to formulate a visual representation of a proposed model, estimate the parameters of the

model, and assess the fit of the model to the data (Byrne, 1994). First, as previously described, a measurement model was created which eliminated six of the original variables in the full model, based on those variables noted by the Wald test appropriate for removal. The Wald test is a statistical test, typically used to test whether an effect exists or not; therefore, the identified independent variables were not statistically significant in relation to the dependent variables and could be removed in order to find a more parsimonious model. The measurement model was found to significantly differ at  $p < .01$  level from the saturated model, with a  $X^2$  difference of 1025.16 and 174 degrees of freedom difference. Models #1, #2, and #3 were created using the most parsimonious measurement model in mind. To examine goodness of fit for the model, chi squared (minimum value of discrepancy), the Comparative Fit Index (CFI), Bentler-Bonett Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Standardized Root Mean Squared Residual (RMSR), and Root Mean Square Error of Approximation (RMSEA) are reported. The chi-squared test is used to detect group differences using frequency data to determine if the frequency of cases possessing some quality varies among levels of a given factor or among combinations of levels of two or more factors (Preacher, 2001). Because chi-square tests the null hypothesis, non-significance demonstrates better model fit; as the chi-square statistic approaches zero, the better the model fit to the data. The Comparative Fit Index evaluates the fit of the estimated model relative to the fit of the independent model where no relationships are estimated between variables; Davis, Levitan, Smith, Tweed, & Curtis, 2006). The CFI is an incremental fit measure used to indicate the extent to which the structural model improves upon the structural null or baseline model (Pilgrim, Schulenberg, O'Malley, Bachman, & Johnston, 2006). Bentler

and Chou (1987) recommend CFI scores of greater than .90 as indicators of good fitting models. The Normed Fit Index compares the improvement in the minimum discrepancy for the specified (default) model to the discrepancy for the independence model (Davis et al., 2006). A value of the NFI below 0.90 indicates that the model can be improved. Byrne (1994) notes that Bentler and Bonett's (1980) Normed Fit Index has been the criterion of choice for goodness of fit, however, the NFI has shown a tendency to underestimate fit in small samples. The NNFI is similar to NFI, but is less affected by sample size (Garson, 1998). For the Non-Normed Fit Index, values close to .90 reflect a good model fit. The Standardized Root Mean Squared Residual (RMSR) is an index of the average differences between the sample variances and covariances and the estimated (model) variances and covariances (Davis et al., 2006). Garson (1998) notes that the closer the RMSR to 0 for a model being tested, the better the model fit. The Root Mean Square Error of Approximation (RMSEA) is a popular measure that also takes into consideration the complexity of the model (i.e. the degrees of freedom; Davis et al., 2006). This is an absolute fit index, which represents the extent to which the observed variances and covariances are accounted for by the model (Pilgrim, et al., 2006). Browne and Cudeck (1992) state that an RMSEA of .08 or less is an adequate fitting model.

Of the three models, Model #2, which included the pathway between relationship attitudes and high-risk sexual behavior outcomes, was the best fit to the data collected ( $X^2 = 368.99$ ), which differed significantly from the measurement model ( $p < .01$ ). Both Models #1 and #2 demonstrated comparable goodness of fit to the data collected ( $X^2 = 1038.31$  and  $X^2 = 1032.93$ , respectively; see Table 9).

*Table 9. Model Comparisons of Goodness of Fit Data*

Fit Statistic	Measurement Model	Model #1	Model #2	Model #3
Chi-squared	858.384 w/169 df	1038.31 w/168 df	368.993 w/16 df	1032.93 w/205 df
Comparative Fit Index (CFI)	.660	.620	.543	.622
Bentler-Bonnet Normed Fit Index (NFI)	.613	.581	.534	.574
Bentler-Bonnet Non-Normed Fit Index (NNFI)	.618	.570	.400	.574
Root Mean-Square Residual (RMR)	.308	.386	.850	.512
Root Mean-Square Error of Approximation (RMSEA)	.202	.222	.429	.201

Specific goodness of fit analyses for Model #1 includes  $X^2$  of 1038.31 with 168 degrees of freedom, an NFI of .581, NNFI of .570, and a CFI of .620. The Root Mean-Square Residual for this model was .386, while the Root Mean-Square Error of Approximation was .222. Model #2 was found to be a much better fit to the data than model #1, as the  $X^2$  fit index increased toward 1.0 when SEM was applied to the second model; however other fit indices were relatively close to those of Models #1 and #3. Model #2 demonstrated a NFI of .534, a NNFI of .400, and a CFI of .543. Root Mean-Square Residual for Model #2 was .850 and RMSEA was .429. The Model #3 diagram illustrated the pathway between individual and environmental risk factors and high-risk sexual behavior outcomes, with attitudes as an additional variable. When goodness of fit statistics are examined for the third model, a NFI of .574 is noted, as well as a NNFI of .574 and a CFI of .622. The Root Mean-Square Residual for model #3 was .512 while the RMSEA was .201. Model #3 was hypothesized to be the best fit to the data due to the inclusion of empirically supported risk factors and attitudes on the measured outcome

behavior. The significance of these findings will be discussed in Chapter five. Path coefficients assess the magnitude of the relationships among the latent and measured variables in the model and are detailed in Figures 4, 5, and 6.

### *Post-hoc Analyses*

Because none of the three models demonstrated good fit to the data (based on the chi-squared statistics) regression analyses were conducted to further explore the possible affects of the predictor variables and attitudes on risky sexual behavior outcomes. Regression is a statistical technique that allows the researcher to predict an individual's score on one variable on the basis of their scores on several other variables (Brace, Kemp, & Snelgar, 2006). Applied to the current study, regression analyses were used to predict the likelihood that an adolescent female would demonstrate a specified risky sexual behavior outcome, based on the data from the environmental risk factors. The sexual behavior outcomes (dependent variables) include an early age of sexual initiation, a high number of sexual partners, and inconsistent use of condom or non-condom contraceptive methods. This statistical approach differs from structural equation modeling in that SEM examines a model as a whole, which typically includes multiple pathways, where regression examines only one pathway. Picking apart the SEM models and examining individual pathways were used to provide insight into which specific pathways are significant for the current data set. The stepwise method of regression was considered because this method enters each variable in sequence and assesses each variable's value; thus ensuring that the resulting final model has the smallest possible set of predictor variables (Brace, et al., 2006). Upon further consideration, the enter method of regression was deemed more appropriate to use than the stepwise method for various

reasons. First, the stepwise method creates a model based on statistical significance of each independent predictor rather than on theoretical design. Thus, any non-significant predictors will be automatically dropped from the model when using the stepwise method, even though theory might dictate those variables to remain. In the current study, Bronfenbrenner's ecological systems theory is the driving force behind the research question and needs consideration throughout analysis; dropped variables must be logically explained in terms of the theory. Another reason the stepwise method was deemed inappropriate for the current study is because it is based on methods (e.g.,  $F$  tests for nested models) that were intended to be used to test pre-specified hypotheses (Gastongnay, 2004). Because the specific variables to be included in the models are yet to be determined, the hypothesis of the current study is not considered pre-specified. Additionally, Edirisooriya (1995) noted that the predictors selected by the stepwise regression method are vulnerable to specification errors, does not necessarily produce the best-fit solution, is susceptible to sampling errors, and is inappropriate to use where the data are subjected to wide margins of measurement errors. With the enter method, also known as the simultaneous method, the researcher specifies the set of predictor variables that make up the model and the success of that model in predicting the criterion variable is then assessed (Brace, 2006). Because the order of the variables is irrelevant in the current analyses, a hierarchical method was not utilized.

#### *Regression models examining SEM models 1 and 3*

*Early Sexual Debut.* First, *all* predictor variables, similar to the variables included in the SEM model #1, were included in a regression model with the risky sexual behavior outcome of early age of sexual debut; however, none of the variables demonstrated

significance to predict the outcome. When attitudes are added to the model, including environmental risk factors regressed onto the sexual behavior outcome of early sexual debut, just as with environmental risk factors alone, no variables demonstrate significance. To further explore possible affects, the environmental risk factors were subdivided into three categories, individual factors, parent factors, and peer factors. When the individual factors (i.e. age, age of menarche, impulsivity, and delinquency) and early sexual debut were included in a regression model, delinquency demonstrated significance ( $p = .002$ ). When attitudes were added to this model, delinquency remained significant ( $p = .003$ ) and no other changes occurred. When parent factors (i.e. both mother and father's monitoring, autonomy support, and warmth) were included in a regression model to early sexual debut, none of the variables demonstrated significance, with or without the addition of attitudes. When peer factors (i.e. friends do not use condoms, friends had more than three sexual partners, friends have used illegal drugs, friends dated someone five years older, and friends get in trouble a lot) were included in a regression model to early sexual debut, both having friends that do not use condoms and having friends who used illegal drugs approach significance ( $p = .052$  and  $p = .060$  respectively). When attitudes were added to this model, both these variables remained significant; however, having friends who do not use condoms demonstrated a slight departure from significance ( $p = .080$ ) while having friends who used illegal drugs moved closer to significance ( $p = .027$ ).

*Number of Sexual Partners.* Examination of a different risky sexual behavior outcome, having a high number of sexual partners, revealed similar findings. When *all* the environmental risk factors are considered, only the delinquency variable

demonstrated significance included in a regression model to high number of sexual partners ( $p = .039$ ). When attitudes are added to this regression model, delinquency remained significant ( $p = .046$ ). A regression model including individual variables (i.e. without parent or peer variables) to high number of sexual partners, delinquency demonstrated a stronger significance level than when all predictor variables were included, both with and without attitudes ( $p = .000$  each). The remaining individual variables continued to display non-significance. Parental variables and high number of sexual partners in a regression model did not reveal any significance, both with and without attitudes. Slight differences in significance levels were found for having friends who do not use condoms and having friends who have used illegal drugs when peer predictor variables and high number of sexual partners were in a regression model. Having friends who do not use condoms was significant ( $p = .045$ ) when regressed onto high number of sexual partners as compared to  $p = .070$  when attitudes are added to the model. Having friends who have used illegal drugs approached significance when regressed onto high number of sexual partners ( $p = .095$ ) but when attitudes are added became significant ( $p = .049$ ).

*Condom Consistency.* The aforementioned trends continue when switching to the examination of condom consistency as the risky sexual behavior outcome. When *all* environmental risk factors were considered in the regression model with condom consistency, delinquency demonstrated significance ( $p = .025$ ). When attitudes were added to this model, delinquency remained significant ( $p = .050$ ). When examining only individual risk factors in a regression model with condom consistency, delinquency demonstrated significance without attitudes ( $p = .000$ ) and with attitudes in the model ( $p$



= .001) similar to regression models including only individual risk factors to early age of sexual debut and to high number of sexual partners. The regression model including parent variables to condom consistency demonstrated non-significance; however father's autonomy support approached significance at  $p = .094$  (without attitudes) and  $p = .115$  (with attitudes). Looking at peer variables to condom consistency in another regression model, none of the variables demonstrated significance, either with or without attitudes added to the model; however, having friends who do not use condoms approached significance in the regression model without attitudes ( $p = .090$ ) and having friends who have used illegal drugs approached significance in the regression model with attitudes ( $p = .083$ ).

*Inconsistent Contraception Use.* Finally, examination of a regression model including *all* the environmental risk factors and the outcome of inconsistent contraception use (other than condoms), revealed no significance with any of the variables. After dividing the model into individual, parental, and peer variables, a regression model including the individual variables and inconsistent contraception use (other than condoms) found the delinquency variable to be significant ( $p = .025$ ) without attitudes and near significance ( $p = .051$ ) when attitudes were added to the model. Additionally, the regression model including the individual predictor variables and attitude variables on inconsistent contraception use (other than condoms) approached significance for the attitude measure subscale of Precursors to Coercion ( $p = .097$ ). When parental predictor variables were considered, none of the variables demonstrated significance in either the regression model with only parental variables and the outcome of inconsistent contraception use (other than condoms) or the same model with attitudes added. A look at

peer predictor variables included in a regression model with inconsistent contraception use (other than condoms) did not reveal any significant variables. However, when the attitude variables were added, the Precursors to Coercion subscale of the AARDR approached significance ( $p = .055$ ) while all other variables remained non-significant.

#### *Regression models examining SEM model #2*

Regression models were also designed utilizing only the AARDR subscales and each individual risky sexual behavior outcome so as to parallel the SEM Model #2. Both the PC and PSP subscales demonstrated non-significance when included in a regression model with the risky sexual behavior outcome of early sexual debut and in a separate model with the outcome of high number of sexual partners. The Precursors to Coercion subscale of the AARDR demonstrated significance when included in a regression model with the risky sexual behavior outcome of condom consistency ( $p = .002$ ) and the outcome of inconsistent contraception other than condoms ( $p = .048$ ). However, the Peer and Social Pressure subscale did not demonstrate significance on either of these outcomes.

It should be noted that in several regression models (specifically those models including all the predictor variables, when attitudes are added, to early sexual debut) the independent variable assessing whether an individual's friends have used illegal drugs comes closer to significance when attitudes are added (without attitudes  $p = .147$ , with attitudes  $p = .089$ ). Another interesting finding is that the parent variable of father's support of autonomy approached significance in the predictors only model, both without attitudes ( $p = .063$ ) and with attitudes ( $p = .070$ ).

### *Significant relationships*

In short, the use of several regression models resulted in identification of significant relationships (see Table 10). Delinquency was a significant individual predictor variable within several regression models including the models with individual predictor variables without and with attitudes to early sexual debut ( $p = .005$ ;  $p = .003$ , respectively) to high number of sexual partners ( $p = .000$ ;  $p = .000$ , respectively), to condom consistency ( $p = .000$ ;  $p = .001$  respectively), and to non-condom method consistency ( $p = .025$ ;  $p = .051$ , respectively). In addition, delinquency was found to be significant in a regression model including all the predictor variables, both with ( $p = .025$ ) and without ( $p = .050$ ) the addition of the attitude variables to condom consistency.

Based on Baron and Kenny's (1986) guidelines for testing mediational effects using regression analyses, attitudes may *partially* mediate the effect of individual predictor variables (i.e. age, age of menarche, impulsivity, and delinquency) on the outcome of condom consistency ( $R^2$  change = .060;  $p = .019$ ). Similarly, attitudes may *partially* mediate the effect of peer predictor variables on condom consistency ( $R^2$  change = .087;  $p = .006$ ). According to Wikipedia.com (2007), when the direct effect between the independent variable and the dependent variable is no longer statistically different from zero after controlling for the mediator variable, the mediation effect is said to be *complete*. However, as in the current study, when the absolute size of the direct effect between the independent variable and the dependent variable is reduced after controlling for the mediator variable, but the direct effect is still significantly different from zero, the mediation effect is said to be *partial*.

*Table 10. Significant Variables in Regression Models*

Model	Significant Variables (Significance level)	R <sup>2</sup>	Change in R <sup>2</sup>
Individual predictor variables to early sexual debut	Delinquency (.002)	.081	_____
Individual predictor variables and attitudes to early sexual debut	Delinquency (.003)	.083	.018
Peer predictor variables to early sexual debut	Friends do not use condoms (.052)	.030	_____
Peer predictor variables and attitudes to early sexual debut	Friends who use illegal drugs (.027)	.040	.026
Individual predictor variables to high number of sexual partners	Delinquency (.000)	.150	_____
Individual predictor variables and attitudes to high number of sexual partners	Delinquency (.000)	.152	.016
Peer predictor variables to high number of sexual partners	Friends do not use condoms (.045)	.026	_____
Peer predictor variables and attitudes to high number of sexual partners	Friends use illegal drugs (.049)	.034	.023
All predictor variables to condom consistency	Delinquency (.025)	.033	_____
All predictor variables and attitudes to condom consistency	Delinquency (.050)	.061	.042
Individual predictor variables to condom consistency	Delinquency (.000)	.098	_____
Individual predictor variables and attitudes to condom consistency	Delinquency (.001) AARDR-PC (.010)	.144	.060* (p=.019)
Parent predictor variables and attitudes to condom consistency	AARDR-PC (.035)	.046	.048
Peer predictor variables and attitudes to condom consistency	AARDR-PC (.002)	.065	.087* (p=.006)
Individual predictor variables to non-condom method consistency	Delinquency (.025)	.022	_____
Individual predictor variables and attitudes to non-condom method consistency	Delinquency (.051)	.034	.027
Peer predictor variables and attitudes to non-condom method consistency	AARDR-PC (.055)	.062	.032
Attitudes alone to condom consistency	AARDR-PC (.002)	.063	_____
Attitudes alone to non-condom method consistency	AARDR-PC (.048)	.017	_____

Regression analyses also revealed that the variable of having friends who do not use condoms was a significant predictor variable in the regression models examining peer predictor models to early sexual debut ( $p = .052$ ) and in a regression model examining peer predictor variables to high number of sexual partners ( $p = .045$ ). The variable of having a friend who uses illegal drugs was found to be a significant peer variable in the regression models including peer predictor variables and attitudes to early sexual debut ( $p = .027$ ) and to high number of sexual partners ( $p = .049$ ). The AARDR Precursors to Coercion scale was found to be a significant factor in several regression models as well. For example, the PC scale was found to be significant at  $p = .010$  in a model including individual predictor variables and attitudes on condom consistency. A model with parent predictor variables and attitudes on condom consistency ( $p = .035$ ), a model with peer predictor variables and attitudes on condom consistency ( $p = .002$ ), and a model with peer predictor variables and attitudes on non-condom method consistency ( $p = .055$ ) were significant.

Finally, when utilizing regression analyses to parallel the SEM analysis of the pathways between attitudes and risky sexual behavior outcomes, attitudes were found to be significant in models linking to condom consistency ( $p = .002$ ) and non-condom contraception method consistency ( $p = .048$ ).

## CHAPTER FIVE: DISCUSSION

Adolescent sexual behaviors can be problematic when risks are taken and teens become pregnant or acquire sexually transmitted diseases. The costs of these consequences are great to families, to society, and to the adolescents themselves. In order to combat these consequences, the current study focused on the role of attitudes and other system influences on adolescents. Specifically the question was asked whether teenage attitudes have a marked influence on sexual behavior outcomes, even when other risk factors within systems of influence are taken into consideration. Results of structural equation modeling indicate that attitudes do indeed have an impact on sexual behavior outcomes; however, when included in analysis with other risk factors, that impact is decreased. Rather, attitudes alone, when other risk factors are taken out of the equation, have a large impact on teenage sexual behaviors. This chapter will discuss the implications of the results presented in Chapter Four. First, the manner in which the results relate to the hypothesis will be explored. Next, the relationship of the results to previous research and theory will be presented. Limitations to the current study will be outlined and suggestions for future research and practice will be discussed.

### *Discussion of the Results of the Hypothesis*

Based on the data collected, results of the current study indicate that a model including adolescent attitudes regarding relationship issues is a more accurate depiction of factors influencing high-risk sexual behaviors than a model including risk factors and a model including both risk factor and attitudes. In other words, risk factors present in the adolescent and environment can reasonably predict some sexual behaviors, but less so if

the teens' attitudes toward relationships are also considered. Results imply that the at-risk, attitude, to outcomes model is conceptually different from the attitudes to outcomes model. These model differences imply that regardless of the strength of environmental factors and the connection between environmental factors and an adolescent's propensity for engaging in risky sexual behaviors, manipulation of attitudes can significantly impact whether a teen chooses to engage in risky sexual behaviors. Although the hypothesis was not supported in the current study, the finding that attitudes are more strongly related to sexual behavior outcomes than risk factors alone is encouraging and has implications for practice, which will be discussed below.

Another possible explanation for the results may have to do with how attitudes are derived. Attitudes toward sensitive issues are often given serious thought and perhaps for many of the participants, their attitudes were created in response to environmental factors of which they did not approve. For example, a teenage girl may actively decide to use contraception or refrain from sexual activity to avoid pregnancy to increase her educational opportunities. This decision may be made in opposition to the presence of environmental risk factors, such as her mother being a high school dropout or her family living at the poverty level.

When considering why attitudes and risk factors together had a poorer fit to the data collected, one should not overlook the directionality of variables. It is unclear if attitudes are shaped by factors present in the individual and environment, leading to sexual decision making, or if attitudes of an individual lead that teenager to choose environments which best suit her attitudes toward relationships and sexual issues.

Post-hoc analyses indicated that when all the environmental risk factors were considered, only delinquency emerged as a significant predictor of an adolescent having a high number of sexual partners or using condoms inconsistently.

Simply looking at the individual predictor variables of age, early age of menarche, impulsivity, and delinquency, again only delinquency demonstrated a significant ability to predict adolescent sexual behaviors. Support was found for delinquency to predict early sexual debut, higher number of partners, condom inconsistency, and non-condom contraception inconsistency. It appears that the regression model including individual factors to the risky sexual behaviors is a better model to utilize with the gathered data because delinquency was linked to all four, rather than only two, of the risky sexual behaviors, as was found in the regression model using all environmental risk factors. Additionally, significance levels were stronger with just individual predictor variables than in the larger model. One possible reason for this discrepancy is that parental and peer variables may have diluted the larger model. It is also important to note that findings support previous research documenting the strong connection between adolescent delinquency and risky sexual behaviors.

Parental supervision, parental support of teen autonomy, and parental warmth were all nonsignificant predictors for a female teen's early sexual debut, high number of sexual partners, and contraception inconsistency.

Examination of peer variables possibly influencing teens' sexual behaviors revealed that having friends who do not use condoms significantly predicts an individual's likelihood of engaging in early sexual intercourse, but only when attitudes are taken into consideration. Similarly, teens having friends who use illegal drugs are



predicted to have an early sexual debut when relationship attitudes are considered.

Having friends who do not use condoms can significantly predict whether a teen will have more than five sexual partners prior to age 18; however, this predictive ability is no longer significant when attitudes are considered. The opposite was found to be true for teens who have friends who take illegal drugs. Having a friend who does illegal drugs can significantly predict whether that teen will have a high number of sexual partners only when attitudes are considered. When the teen's attitudes are not part of the equation, the predictive ability of this variable is lost. No other peer variables were found to aid in the prediction of inconsistent condom and non-condom contraceptive methods.

#### *Relationship of the Results to Previous Research and Theory*

Study results do not support the ecological systems theory as it was expected that a model including risk factors at the micro-, meso-, exo-, and macrosystems levels, along with attitudes, would demonstrate the strongest connection to the high risk sexual behavior outcomes. Results contradict the findings of several researchers who explored social contexts for adolescent sexual activity and found support for ecological systems theory (Beitz, 1995; Blum & Mmari, 2005; Butler, 2003; Corcoran et al., 2000; Costa et al., 2005; Kotchick et al., 2001; Michel, et al., 2005, Turbin et al., 2006; Woodward et al., 2001). Possible reasons for this significant departure from other literature are discussed below as limitations.

Although the hypothesis was not supported, the current study contributes to the existing literature in several ways. First, this is the only study known which compared the influence of attitudes versus risk factors on high-risk sexual behaviors. This study can also be added to the literature as one of the few studies that examines numerous levels of

influence on behavioral outcomes and the interactions of those systems variables.

Additionally, the current study extends the literature by providing clear criteria for when a behavior is deemed “problematic.” One of the conceptual difficulties in previous research examining developmental tasks is that some level of the risky behavior is expected. Rather, it is when a behavior emerges too early, or is demonstrated too often or too intensely that it is deemed problematic. This study operationalized variables based on compilation of various studies examining sexual behaviors and it is hoped that some of the variable criteria will be used in future studies.

Descriptive statistics demonstrate that for the most part, participants are experiencing sexual behaviors and the consequences associated with those at similar prevalence rates described in previous literature. For example, it has been noted that a large percentage of girls engage in sexual intercourse prior to age 15 (Albert et al., 2003; Kirby, 1997; Terry & Manlove, 2000). Similarly, approximately 20 % of participants in the current study reported having sex prior to age 15. Findings also support the literature reports that early sexual debut is related to multiple aspects of high-risk sexual behaviors, such as inconsistent condom use, pregnancy, increased STD exposure, and a greater number of sexual partners (Blum & Mmari, 2005; Koyle et al., 1989; McGuire III, et al., 1992; Miller, 1997; Smith, 1997).

When the reported prevalence rates of the four high-risk sexual behaviors are reviewed, there is some evidence to support Jessor’s (1991) problem behavior theory. Of the 45 participants who demonstrated at least one of the study’s defined high-risk sexual behaviors, 16 of those girls reported that they are demonstrating more than one risky sexual behavior. This is approximately a third of those subjects who reported

demonstrating a risky sexual behavior. All participants who reported experiencing multiple high-risk sexual behaviors reported their first consensual sexual experience to have occurred prior to age 17, implying that this particular high-risk sexual behavior is most prevalent. If future studies find this high-risk behavior to have strong connections to attitudes and risk factors, prevention programs should target delaying onset of sexual intercourse.

Support for the idea that attitudes can impact behaviors relates to findings that have been found in the rape prevention literature. The impact of attitudes on behaviors supports Abrahamse et al.'s (1998) conclusions that characteristic reproductive patterns across racial groups implicate attitudinal differences toward teenage pregnancy. Additionally, Koss and Dinero's (1989) findings that sexual attitudes play a major role in predicting the chances of being raped are supported. Lonsway and Fitzgerald (1994), as well as Brecklin and Forde (2001), described the common use of attitudes in rape prevention programs and results imply similar strategies for high-risk sexual prevention.

There is some evidence documenting commonalities between the risk factors that relate to high-risk sexual behaviors and the same factors present in women who have experienced sexual violence and/or sexual victimization. For example, Hall and Flannery (1985) found that adolescent girls whose closest friends were sexually active were more likely to have been raped than were girls whose closest friends had not yet engaged in sexual intercourse. Also Koss (1985) reported that rape victims reported a larger number of sexual partners and an earlier age for first intercourse than non-victimized women. The current study also found that girls whose friends have sex and who experienced early age of sexual intercourse are predictors for other high-risk sexual behaviors. These findings

provide support for links between sexual experience and sexual victimization. It is suggested that future research further explore the connection between sexual experience and sexual victimization to determine how the two might relate in order to provide additional ideas for prevention efforts on both fronts. Additionally sex education curricula and high-risk sexual behavior prevention programs should include components that address reducing sexual victimization, as it appears the two may be correlated.

The father-daughter relationship has been found to be influential on the daughter's engagement in sexual activities (Blum & Mmari, 2005; Dittus, et al., 1997; Ellis et al., 2003; Lonning, 1993; Rodgers, 1995). In the current study, father involvement in particular seems to lacking, thus having implications for the participants' engagement in sexual activities. For example, approximately 30% of participants indicated that it is "not true" that their fathers find time to talk with them, 50% indicated that it is "very true" that their fathers do not seem to think of them often, and 38% reported it to be "very true" that their fathers are not very involved with their concerns. Recommendations for further research include additional exploration of this relationship and what variables strengthen it. Encouraging fathers to assume an active role in the sexual socialization of their daughters is needed, perhaps by aiding in the dissemination of sexual information and sexual values in prevention and intervention programs.

#### *Limitations of the Current Study*

The findings of the present investigation should be interpreted in light of the following limitations. First, a pilot study was not conducted which may have identified potential problems with participant/school recruitment, methodology, and/or instruments. A pilot study was deemed unnecessary as a previous student investigator had conducted

pilot research on the AARDR and the majority of questionnaire items have undergone empirical scrutiny. However, as a learning experience, a pilot study would likely have been beneficial in identifying potential problems. For example, a few of the questionnaire items may have been worded in a way that affected participant responses. Item 13 asked participants to indicate how frequent they engage in consensual sexual intercourse with options of: *I have never had sexual intercourse; one time total; less than once a month; 1 to 3 times a month; and more than 3 times per month.* Two participants asked how to respond to this item when they engaged in frequent intercourse previously, but currently do not. One of these participants wrote on her questionnaire, “I have had sex a lot. Almost every day. But now not at all.” To acquire a more accurate representation of intercourse frequency, the item should be phrased within a specific time frame, such as within the past six months. Additionally, consideration should be given for adding an item about intercourse frequency changes. Although only two participants identified this item as problematic, it is unknown how many other girls may have struggled with the item. A similar wording problem noted was with item 4, which asked participants to indicate how many people they have dated. Because “dated” was not operationalized, participants may have assumed different definitions of “date” to include “going out” (when teens simply decide they are boyfriend/girlfriend, but do not actually go anywhere), going somewhere with a group of friends (some of who may be members of the opposite sex), having dinner with a boy who asked the girl out on a date, and many others. Because of this lack of operationalization, there is no consistency between response meaning and responses should not be logically connected to other dating behaviors reported. Additionally several participants asked the definition of “coercion”

on the AARDR. Although this definition is explicitly stated on the questionnaire, placing the definition within the item might lead to less confusion in the future.

The location of two items may have affected responsiveness to those items. Whether participants' families had immigrated to the U.S. in the last five years and whether participants were eligible for free/reduced lunches were yes/no questions placed within longer multiple-choice questions. These items were also located at the bottom and top of pages, respectively, making them easily overlooked. A total of nine participants did not respond regarding U.S. immigration and eleven did not respond regarding lunch status; this information may have altered the demographics of the sample. Placing these items with other yes/no questions might increase responsiveness.

Some considerations regarding generalizability are warranted. As only public school students participated, students in private schools, those being home-schooled, and high school dropouts were not included and their inclusion may have enhanced the generalizability of the results. Matching participant ethnicity percentiles to U.S. data would also improve generalizability as African-Americans were found to be under-represented. In general, results primarily generalize to small-town rural Caucasian America. Another consideration is sample size. Although enough participants were recruited to meet the minimum standard of having at least ten subjects per variable, missing items were not considered and several cases had to be dropped from scale measurement due to missing items. Rerunning the study with a larger sample size might have a dramatic difference in results.

Creation of the measurement model resulted in six additional variables being excluded in order to give the measurement model a stronger chi-square goodness of fit

statistic than the originally proposed model (see Tables 5 & 6). Specifically, family form, socio-economic status, and mother's education were eliminated from the predictor variables; the support for healthy attitudes scale was eliminated from the AARDR measurement of attitude as a construct; and ever having had an STD or been pregnant were eliminated from the outcomes. Because the literature clearly demonstrated these variables significant enough to warrant their inclusion in the original model, how these variables were measured needs further examination to determine if construct validity was impaired.

Measurement issues should also be considered. The Perceptions of Parents Scale has a child scale and college-student scale, but no scale specifically designed for adolescents. It was decided that the college-student normed scale was most appropriate of the two available scales due to the developmental similarities between the POPS college level items and other items in the study. The developmental differences between the adolescent participants in this study and the college students on which the POP was normed are considerably different and may have impacted the results of this study. As stated in the literature review, modern adolescents are facing more "adult" issues, such as whether to participate in sexual activity, at younger ages, at increasing rates. Norming the POPS college form on adolescents may be helpful for increased use of the scale. Similarly, the POP Involvement scales were used as measures of parental supervision. Another measurement issue involves construct validity. The Youth Self Report ADHD scale was used to measure impulsivity, but other ADHD symptoms present in scale items may have made the ADHD scale less appropriate as a measure of impulsivity. A better measure of impulsivity may have been the Immediate Memory Test/Delayed Memory Test

(IMT/DMT) which has been used to measure impulsivity in adolescents and shown significant group differences between substance use, conduct problems, and community controls, while also correlating significantly with self-reported measures of impulsivity (Thompson, Whitmore, Raymond, & Crowley, 2006) Finally, items inquiring about subject perceptions of peer norms need to have more empirical strength. In particular, the last item of the questionnaire inquired whether subjects perceived that their friends got in trouble “a lot.” This item would be improved if it is operationalized guided by relevant literature. Finding scales with high construct validity for these specific variables would improve the study.

The lack of inclusion of school variables as part of the mesosystem level is another limitation, specifically underachievement. Previous research has linked teens’ underachievement to risky sexual behaviors (Blum & Mmari, 2005; Hardy, Astone, Brooks-Gunn, Shapiro, & Miller, 1998; Martin et al., 2005; Scaramella, Conger, Simons, & Whitbeck, 1998) and between sexual activity and low academic aspirations (Blum & Mmari, 2005; Chang et al., 2003; Costa, et al., 1995; East, 1998; Handler, 1990; Harris, et al., 2002; Hendricks & Montgomery, 1984; Hogan & Kitagawa, 1985; Jessor & Jessor, 1975; Schvanevelt, Miller, Berry, & Lee, 2001; Scott-Jones & White, 1990; Streetman, 1996; Upchurch & McCarthy, 1990). These variables were not measured in the current study due to administrative barriers. Future research involving collection of student grades should include a flexible timeframe to ensure that this data can be collected.

Another limitation to discuss is subject selection. When recruiting parental consent, some parents voiced concern over having their daughter complete a questionnaire asking about specific sexual behaviors, while others expressed appreciation that sexual issues



were being explored for better prevention efforts. Parents' motivation may have impacted results in that data was obtained from participants whose parents may have had specific opinions (positive or negative) about the content of the study. It is not known how many parents did not give consent due to negative bias against the study content, likely increasing the probability that more parents who are open about sexual issues consented to their daughters' participation. Additionally, girls who returned their consent forms may be more responsible overall, including responsible regarding their sexual behaviors. Another possible motivation for girls who returned the consent form may simply be more interest in sex. Overall, motivation for participating in the study may have impacted subject selection.

Timing of the questionnaire distribution may have also played a role in participation. For several participants, questionnaires were distributed during study hall and a few stated that they would have liked to complete the questionnaire, but could not at that time because they had planned to study for an exam during their study hall time. Fortunately these girls were allowed to complete the questionnaire independently at a later date with the school counselor. Additionally, incentives were offered to both parents and students for participating in the study, which may have introduced sampling bias. Finally, although the BIDR-IM scale was used to assess social desirability, participants may have been responding in less than completely truthful ways. Subject selection could be improved by randomly selecting participants through a population database, school records, or the phone book; however, parental consent issues would remain potentially biasing unless consent was waived.

Another limitation is the cross-sectional design, as this study examined the relationships between different variables at a point in time. In other words, the data collected is simply a “photograph” of the examined variables at a specific point in time. A concern with cross-sectional data is that determining which variables preceded each other is difficult. For example, the data collected cannot determine whether attitudes influenced sexual behaviors or sexual behaviors influenced attitudes. Additionally, while these findings may be true currently, it cannot be determined whether the findings would consistently be found to hold true. A longitudinal study, in which observations of the same items, in the same participants, over long periods of time, would better track the trends of the variables described and more accurately depict the predictors of sexual behaviors.

#### *Implications for Future Research and Practice*

The findings of this study have a number of implications for future research and practice. This section includes plans for improving the current study, considerations for prevention programs and further uses of the AARDR, as well as some additional suggestions.

One direction for future research is to measure the same variables in the same models, but altering how attitudes are measured and the role of attitudes in the model. Specifically, measuring attitudes after participation in a prevention or intervention program and analyzing the attitude construct as a moderating variable between environmental risk factors and risky sexual behaviors. Examination of a moderational effect is more appropriate when a third variable (in this case, attitudes) entails experimental manipulation (Baron & Kenny, 1986).

Another statistical direction for future research is to examine the path between environmental risk factors, attitudes (as measured on the AARDR), and sexual behaviors for various youth groups for comparison purposes (i.e. between the participating schools). If distinct differences in the path diagrams are found, such as stronger relationships between specific latent variables and attitudes, then at-risk groups for risky sexual behaviors can be identified to target preventive efforts. On the other hand, if no distinct differences were noted, the data could be eye-opening for parents and help emphasize the importance of prevention efforts for all children. To extend the findings, subject groups could be recruited for the purpose of group comparisons (i.e. church youth groups, detainees at juvenile justice centers, students of both high and low SES, etc) and the survey could be distributed to these group members. The current study could also be improved by acquiring additional data as measures, rather than relying solely on self-report data, in order to reduce social desirability in responding. For example, the delinquency variable could include number of office referrals in the school setting.

Of concern is the finding that risk for rape includes the same factors as risk for sexual behaviors. Koss (1985) analyzed data via multivariate analysis of variance (MANOVA) from questionnaires and interviews with college students. A comparison of four groups ranging from victimized (coerced) women to non-victimized (consensual) women revealed differences in sexual values regarding premarital sexual intercourse, number of sexual partners, and age at the time of first sexual intercourse (Koss, 1985). In addition, acknowledged rape victims reported more liberal sexual values, a larger number of sexual partners, and an earlier age for first intercourse than the non-victimized women. In a separate study, Koss (1985) reported that women who engage in sexual intercourse at

an earlier age and have a larger number of sexual partners are more likely to be sexually victimized. The connection between risk factors and rape is not the focus of this study, but because of the overlap, lends importance to the examination of these factors. The relationship between “problem behaviors” and risk of rape needs further exploration. A few studies noted the connections between risk factors, being raped, and rape attitudes. Koss and Dinero (1989) examined the accuracy of predicting rape and lesser sexual assaults among college women, based on a set of 14 risk factors. Although the majority of their risk factors did not discriminate rape victims from non-victims, four variables (sexual abuse, sexual attitudes, alcohol use, and sexual activity) represented nearly all of the discriminating power. These findings indicate that sexual attitudes play a major role in predicting the chances of being raped.

Empirically-based treatment and prevention programs appear to lack a comprehensive approach to addressing high-risk sexual behaviors. Problematic behaviors should be addressed as a cluster, rather than as distinct, separate behavior problems, as recommended by Jessor (1991). Finally, the use of attitude change to lead to behavior change is recommended. An examination of the Substance Abuse and Mental Health Services Administration (SAMHSA) Model Programs (2006) reveals that several programs target adolescent risky behaviors, such as sexual activity, violence, and other related problems, the majority of which focus on substance abuse. Many of the programs include emphasis on the familial influence on teen behaviors; Families that Care: Guiding Good Choices focuses on guiding parental involvement to buffer children against later problems, such as risky sexual behaviors, while Brief Strategic Family Therapy is designed to eliminate substance abuse risk factors by strengthening family relations

(SAMHSA, 2006). A few programs add the influence of environmental risk and protective factors, such as Creating Lasting Family Connections. The Families and Schools Together program contains all the aforementioned components and adds focus on the family-school relationship (SAMHSA, 2006). Three programs were found which include addressing the influence of the community/neighborhood and school on adolescent risky behavior as guided through the influence of family, such as the SAFE Children program (SAMHSA, 2006). Multisystemic Therapy emphasizes intervention at various systems levels and targets chronic adolescent problems (SAMHSA, 2006). The All-STARS school/community based program appears the most comprehensive of all the SAMHSA (2006) empirically-based programs as it is designed to prevent premature sexual activity and other high-risk behaviors at the school, community, and familial levels. The All-STARS program also includes nine booster lessons in its second year, to lengthen treatment effects (see recommendation in Heppner, Humphrey, and Hillenbrand-Gunn, 1995). Of these programs, none mention the use of attitude change in influencing behavior change or the influence/intervention at the macrosystem level and addition of these components are suggested.

The decision-making literature revealed that because adolescents are inexperienced with negative consequences, they often imagine these consequences of their behaviors to be “not that bad” (Reyna & Farley, 2006, p.6). To give teens some insight into the negative consequences of risky sexual behaviors, a “mock STD” could be role-played, similarly to the Baby Think it Over Program requiring teens to be “parents” to an infant simulator; participation of which has demonstrated significant reduction in teenage pregnancies (Realityworks, 2006).

As stated previously, the literature on adolescent decision-making is inconclusive at this point and additional research needs to be conducted in this area. Although many researchers note that cognitive abilities are present for rational decision-making in adolescents, why many teens chose not to make “logical” choices regarding risky behaviors is debated. In an application sense, it is suggested that prevention programs include more focus on improving teens’ understanding of their decision-making processes (e.g. metacognition) and focus on barriers which prevent them from following through with decisions they voice to be in their best interests. In relation to the current study, 6.1% of participants reported that they foresee themselves as being sexually active in the upcoming year, calling into question how teens characterize the conditions under which they would consider in engaging in sexual intercourse.

Although not the focus of this study, clearly there needs to be more research on how partner communication affects sexual behaviors and decision-making. Some programs include a negotiating component to assist teens in discussing sensitive issues with their partners, such as contraception, but endorsement of these skills needs to be more widespread. Additionally, the literature demonstrates that peer influence on sexual behaviors is strong. Some programs include strategies to target this pressure as a teen *being influenced* by a friend but no programs were noted to target this pressure as a teen *exerting influence* on a friend. The international research (in developing countries) does not add to our understanding of this phenomenon, due to few studies examining peer influence. Blum and Mmari’s (2005) meta-analysis did not find enough studies examining peer and partner variables to make conclusive statements regarding those

relationships to sexual behaviors. Expanding international research in these areas is suggested.

Future research should also include improved understanding of school variables related to adolescent sexual behaviors. For example, one specific variable to examine is the teachers' role in students' sexual behaviors. The AARDR item addressing this issue is, *My teachers have taught me to respect myself and my body*, and 82 of 132 participants (66.2%) responded that they "agree" or "strongly agree" with this statement, but how this influence is exerted is unclear. Jackson's (2004) dissertation, as cited previously, found that participants who felt supported by teachers in the school environment were less likely to engage in high-risk sexual behavior (as determined by the frequency of contraceptive use during the previous year). The role of teachers' influence on teens' sexual behaviors needs much further exploration.

Additionally, one dissertation study found examined the relationship between perceived school belonging and high-risk sexual behaviors in female adolescents and found a negative relationship between the variables (Jackson, 2005). Although school belonging was not examined in the current study as a separate construct, items on the attitude measure address whether participants feel supported by the school environment for their sexual/relationship attitudes.

Additional research is also suggested in relation to family structure. Single parent households have been found to be a risk factor for high-risk sexual behaviors (Moore, 1998; Podhisita, et al., 2001; Robbins, et al., 1985); however, little research has been conducted on families of alternative composition, such as grandparents as parents, teens

residing with friends, children in foster care, and others. It is recommended that the influence of these family types be examined in relation to sexual behaviors and attitudes.

Sexual intercourse, as a behavior, is analyzed throughout the literature as being related to other factors due to the negative consequences that may accompany that behavior, such as contraction of a sexually transmitted disease and/or pregnancy. However, little attention is given to other risky sexual behaviors that may carry similar consequences, such as oral and anal sex. Similarly, only a few studies were found in which homosexual relationships were explored. These behaviors warrant additional consideration in terms of risky behaviors. Examining the relationships between early sexual debut and other high risk sexual behaviors (having been pregnant/STD, inconsistent contraception use, and having 5 or more sexual partners) may be helpful in understanding a possible cumulative effect of risky sexual behaviors. All participants who reported demonstrating two or more high-risk sexual behaviors reported having an early sexual debut.

Common sense dictates that frequent sexual activity offers increased opportunities to experience the negative consequences associated with sex. In the current study sixteen participants (12.1%) reported having sex more than three times per month. It is unknown whether simply reducing the frequency of sexual intercourse (as opposed to abstinence) is used in sex education curricula as STD and pregnancy prevention strategies. Research examining the effectiveness of intercourse frequency reduction in decreasing STD/pregnancy is suggested.

Exploration of reasons behind contraception choice could provide insight to motivating teens to consider additional contraception methods. Of the contraceptive



choices available, approximately 30% of participants in the current study primarily reported using condoms, while only 17% reported using oral contraception and 16% reported using the withdrawal method or “pulling out.” A few participants reported using the rhythm method, Depo-Provera, the contraception patch, and emergency contraception; however, four additional types of birth control methods were not utilized by even one subject in the study. Condoms may be the most popular method because they are inexpensive and easy to obtain, they provide good protection against sexually transmitted diseases and pregnancy, and they are less conspicuous than other methods. Prevention programs should discuss other contraception methods which share some of these characteristics, such as spermicides. Additionally, previously cited literature noted that positive attitudes toward condom use increased their use (Blum & Mmari, 2005; DiClemente, 1992; Jemmott & Jemmott, 1990) but only one study was found which examined the relationship of attitudes toward other contraceptive methods (Blum & Mmari, 2005). It is recommended that attitudes specific to various contraceptive methods be examined, and if demonstrated to impact contraception use, should be added to prevention programs.

Although exosystemic and macrosystem factors have been somewhat examined in the literature, more work needs to be in this area to specifically determine the role of cultural and societal influences on teens’ sexual behaviors. In particular, the use of the Internet and technology, neighborhood characteristics such as arrest rates, and institutional barriers, were explored in very few studies.

Of interest is that some of the participants chose to add written comments about specific items on the questionnaire, which provided some insight into thought patterns

and attitudes. For example, one participant responded to the item, *If a girl gets drunk or high at a party, it's her own fault if a guy pushes himself on her sexually*, with “Hell no!” Another participant commented on the item, *Scoring with as many girls as possible makes guys more popular*, with “To their friends, but not future girlfriends!” Some comments contradicted response choice. For example one item states “*Emotional abuse*” or “*psychological abuse*” is a normal part of dating relationships. A participant wrote, “Yeah, but it shouldn’t be.” Her chosen response indicates that she “strongly agrees” with this statement, but her written comment indicates otherwise. A qualitative study exploring teens’ thought patterns regarding these issues is suggested to provide direction for continued improvements of the AARDR and additional research ideas.

### *Conclusion*

Based on the discussion of results of this study, several conclusions can be summarized. First, it is clear that relationship attitudes affect relationship behaviors; how attitudes and risk factors together impact behaviors needs more exploration. Secondly, clear operationalization of sexual variables is helpful in determining when developmental tasks are deemed “problematic.” Thirdly, high-risk sexual behaviors appear to function in a cluster for many teens. Additionally, the father-daughter relationship appears to have great influence over teens’ sexual behaviors. Finally, and most importantly, the prevalence of risky sexual behaviors remains alarming.

## REFERENCES

- Abell, R. R. (2003). Sexual behavior among female adolescents in public housing: Self-efficacy and communication and social bonding with parents and peers. [Abstract]. *Dissertation Abstracts International*, 64-08(A), 2703.
- Abrahamse, A. F., Morrison, P. A., & Waite, L. J. (1988). Teenagers willing to consider single parenthood: Who is at greatest risk? *Family Planning Perspectives*, 20, 13-18.
- Achenbach, T. M. (1991). *Manual for the Youth Self-Report and 1991 profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Ajzen, I., & Fischbein, M. (2005). The influence of attitudes on behavior. In D. Albarracin, B.T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes* (pp. 173-222). Mahwah, NJ: Erlbaum.
- Alan Guttmacher Institute. (1999). *Teenage pregnancy: Overall trends and state-by-state information*. New York: Author.
- Albaracin, D., McNatt, P. S., Klein, C. T. F., Ho, R. M., Mitchell, A. L., & Kumkale, G. T. (2003). Persuasive communications to change actions: An analysis of behavioral and cognitive impact in HIV prevention. *Health Psychology*, 22(2), 166-177.
- Albert, B., Brown, S., & Flanigan, C. (Eds.). (2003). *Fourteen and younger: The sexual behavior of young adolescents*. Washington, DC: National Campaign to Prevent Teen Pregnancy.
- Ary, D. V., Duncan, T. E., Biglan, A., Metzler, C. M., Noell, J. W., & Smolkowski, K. (1999). Development of adolescent problem behavior. *Journal of Abnormal Psychology*, 27(2), 141-150.
- Bachanas, P. J., Morris, M. K., Lewis-Gess, J. K., Sarett-Cuasay, E. J., Sirl, K., Ries, J. K., et al. (2002). Predictors of risky sexual behavior in African American adolescent girls: Implications for prevention interventions. *Journal of Pediatric Psychology*, 27(6), 519-530.
- Bandura, A. (1989). Perceived self-efficacy in the exercise of control over AIDS infection. In V. Mays, G. Albee, & S. Schneider (Eds.), *Primary prevention of AIDS: Psychological approaches* (pp.128-141). Newbury Park, CA: Sage.

- Bardone, A. M., Moffitt, T. E., Caspi, A., Dickson, N., & Silva, P. A. (1996). Adult mental health and social outcomes of adolescent girls with depression and conduct disorder. *Development and Psychopathology*, 8, 811-829.
- Barger, S. D. (2002). The Marlowe-Crowne affair: Short forms, psychometric structure, and social desirability. *Journal of Personality Assessment*, 79(2), 286-305.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategies, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Barthlow, D. J., Horan, P. F., DiClemente, R. J., & Lanier, M. M. (1995). Correlates of condom use among incarcerated adolescents in a rural state. *Criminal Justice and Behavior*, 22, 295-306.
- Baughn-Cunningham, C. R. (1999). Family factors as predictors of African- American adolescent sexual behavior. [Abstract]. *Dissertation Abstracts International*, 61-02(B), 1071.
- Becker, E., Rankin, E., & Rickel, A. U. (Eds). (1998). *High-risk sexual behavior: Interventions with vulnerable populations*. New York: Plenum Press.
- Beitz, J. M. (1995). Social and educational factors affecting sex knowledge, attitudes, and behaviors of college students. [Abstract]. *Dissertation Abstracts International*, 56-04(A), 1246.
- Benda, B. B., & DiBlaso, F. A. (1991). Comparison of four theories of adolescent sexual exploration. *Deviant Behavior*, 12(3), 235-257.
- Benda, B. B., & DiBlaso, F. A. (1994). An integration of theory: Adolescent sexual contacts. *Journal of Youth and Adolescence*, 23, 403-420.
- Bentler, P. M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software, Inc.
- Bentler, P. M. & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods and Research*, 16(1), 78-117.
- Bentler, P. M., & Newcomb, M. D. (1986). Personality, sexual behavior, and drug use revealed through latent variable methods. *Clinical Psychology Review*, 6, 363-385.

- Berenson, A. B., Breitkopf, C. R., & Wu, Z. H. (2003). Reproductive correlates of depressive symptoms among low-income minority women. *Obstetrics and Gynecology*, 102, 1310-1317.
- Bettinger, J. A. (2004). The influence of STD risk perceptions and family factors on sexually transmitted diseases in female adolescents. [Abstract]. *Dissertation Abstracts International*, 65-04 (B), 1804.
- Bingham, C., & Crockett, L. J. (1996). Longitudinal adjustment patterns of boys and girls experiencing early, middle, and late sexual intercourse. *Developmental Psychology*, 32, 647-658.
- Black, C., & DeBlassie, E. R. (1985). Adolescent pregnancy: Contributing factors: Consequences, treatment and plausible solutions. *Adolescence*, 20, 281-290.
- Black, M. M., Ricardo, I. B., & Stanton, B. (1997). Social and psychological factors associated with AIDS risk behaviors among low-income, urban, African-American adolescents. *Journal of Research on Adolescence*, 7, 173-195.
- Blatt, S. J. (1991). Depression and destructive risk-taking behavior in adolescence. In L. P. Lipsitt & L. L. Mitnick (Eds.), *Self-regulatory behavior and risk-taking: Causes and consequences* (pp. 285-307). Norwood, NJ: Ablex Publishing.
- Blum, R. W., & Mmari, K. N. (2005). *Risk and Protective Factors Affecting Adolescent Reproductive Health in Developing Countries*. Geneva: World Health Organization.
- Boyer, C. B., Tschann, J. M., & Shafer, M. (1999). Predictors of risk for sexually transmitted diseases in ninth grade urban high school students. *Journal of Adolescent Research*, 14(4), 48-465.
- Brace, N., Kemp, R., & Snelgar, R. (2006). *SPSS for psychologists: A guide to data analysis using SPSS for windows* (3<sup>rd</sup> ed.). Hampshire, England: Palgrave MacMillian Ltd.
- Brecklin, L. R. & Forde, D. R. (2001). A meta-analysis of rape prevention programs. *Violence and Victims*, 16(3), 303-321.
- Bridgman, A., & Phillips, D. (Eds.). (1998). *New findings on poverty and child health and nutrition: Summary of a research briefing*. Washington, DC: National Academy of Sciences.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513-531.

- Bronfenbrenner, U. (1979). *The Ecology of human development*. Cambridge, MA: Harvard University Press.
- Brooks-Gunn, J., & Chase-Lansdale, P. L. (1995). Adolescent parenthood. In M. Bornstein (Ed.), *Handbook on parenting: Vol. 3. Who is the parent?* (pp. 113-149). Mahwah, NJ: Erlbaum.
- Brown, J. D., Halpern, C. T., & L'Engle, K. L. (2005). Mass media as a sexual super peer for early maturing girls. *Journal of Adolescent Health, 36*, 420-427.
- Brown, L. K., DiClemente, R. J., & Park, T. (1992). Predictors of condom use in sexually active adolescents. *Journal of Adolescent Health, 13*, 651-657.
- Browne, A., & Finkelhor, D. (1986). Impact of child sexual abuse: A review of the research. *Psychological Bulletin, 99*(1), 66-77.
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research, 21*(2), 230-258.
- Burt, M. R. (1980). Cultural myths and supports for rape. *Journal of Personality and Social Psychology, 88*, 217-230.
- Butler, C. A. (2003). A qualitative study of HIV sexual risk behavior among white female street youth. [Abstract]. *Dissertation Abstracts International, 63*, 5787.
- Bynum, M. A. S. (1999). Mother-daughter relationships and sexual outcomes in late-adolescents: A study of African American mothers and daughters. [Abstract]. *Dissertation Abstracts International, 60-10*(B), 5249.
- Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows: Basic concepts, applications, and programming*. Thousand Oaks, CA: Sage Publications.
- Callor, S. (1993). Predictors of precocious adolescent sexual activity. [Abstract]. *Masters Abstracts International, 31-04*, 1468.
- Campos, C. G. (2001). Predicting high-risk behaviors among youth: A comparison of depressed, non-suicidal, suicidal ideators, and suicidal attempters. Unpublished master's thesis, University of Missouri-Kansas City.
- Carlson, J., Clark, T., Cowl, A., Grant, S., Segool, N., Wilkinson, A., et al. (2005). *Exploring behavioral risk and protective factors in at-risk preschoolers*. Poster session presented at the 113<sup>th</sup> Annual National Convention American Psychological Association, Washington, DC.

- Cavanaugh, S. E. (2001). Sexual activity of girls in early adolescence: The intersection of pubertal timing and friendship group dynamics. Unpublished master's thesis, University of North Carolina at Chapel Hill.
- Cazenave, N. A. (1981). Black men in America: The quest for manhood. In H. P. McAdo (Ed.). *Black Families*. Newbury Park, CA: Sage Publications.
- Centers for Disease Control and Prevention. (2000). *Cumulative AIDS cases; exposure categories; ten states/territories and cities reporting the highest number of AIDS cases; international statistics*. Retrieved 9/13/05 from <http://www.cdc.gov/hiv/stats.htm>.
- Centers for Disease Control and Prevention. (2001). *Sexually transmitted disease surveillance*. Atlanta, GA: Author.
- Centers for Disease Control and Prevention. (2002). *HIV/AIDS Surveillance report*, 13(2), 1-44.
- Centers for Disease Control and Prevention. (2004a). *Cases of HIV infections and AIDS in the United States*. Retrieved 8/7/05 from <http://www.cdc.gov/hiv/stats2004SurveillanceReport.pdf>.
- Centers for Disease Control and Prevention. (2004b). Youth Risk Behavior Surveillance: United States 2003. Retrieved 8/10/05 from <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5302a1.htm>.
- Centers for Disease Control and Prevention. (2006). Youth Risk Behavior Surveillance: United States 2005. *Morbidity and Mortality Weekly Report*, 55(SS-5), 1-112.
- Chang, V. Y., Bendel, T. L., Koopman, C., McGarvey, E. L., & Canterbury, R. J. (2003). Delinquents' safe sex attitudes: Relationships with demographics, resilience factors, and substance use. *Criminal Justice and Behavior*, 30(2), 210-229.
- Chen, A. C. (2004). What do we know about adolescent risky sexual behavior: A multi-level environmental approach. [Abstract]. *Dissertation Abstracts International*, 65-04(B), 1775.
- Christopherson, C. R. (1993). Pubertal development, parent-teen communication, and sexual values as predictors of adolescent sexual intentions and sexually related behaviors. [Abstract]. *Dissertation Abstracts International*, 54-12(A), 4599.
- Citizens for Missouri's Children. (2005). *Kids count Missouri 2005 data book*. Retrieved 1/4/07 from <http://www.mokids.org>
- Cone, J. D. & Foster, S. L. (2005). *Dissertations and theses from start to finish* (13<sup>th</sup> Ed.). Washington, D.C.: American Psychological Association.

- Cooper, M. L., Wood, P. K., Orcutt, H. K., & Albino, A. (2003). Personality and the predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology*, 84(2), 390-410.
- Corcoran, J. (2001). Multi-systemic influences on the family functioning of teens attending pregnancy prevention programs. *Child and Adolescent Social Work Journal*, 18(2), 37-49.
- Corcoran, J., Franklin, C., & Bennett, P. (2000). Ecological factors associated with adolescent pregnancy and parenting. *Social Work Research*, 24(1), 29-39.
- Costa, F. M., Jessor, R., Donovan, J. E. & Fortenberry, J. D. (1995). Early initiation of sexual intercourse: The influence of psychosocial unconventionality. *Journal of Research on Adolescence*, 5, 93-121.
- Costa, F. M., Jessor, R., Turbin, M. S., Dong, Q., Zhang, H., & Wang, C. (2005). The role of social contexts in adolescence: Context protection and context risk in the United States and China. *Applied Developmental Science*, 9(2), 67-85.
- Courtois, C. (1979). The incest experience and its aftermath. *Victimology: An International Journal*, 4, 337-347.
- Cox, M. F. (2006). Racial differences in parenting dimensions and adolescent condom use at sexual debut. *Public Health Nursing*, 23(1), 2-10.
- Crisanto, A. (2006). Female adolescents and sexual behaviors on the Internet. *Dissertation Abstracts International*, 66(11-B), 6332.
- Crockett, L. J., Bingham, C. R., Chopak, J. S., & Vicary, J. R. (1996). Timing of first sexual intercourse: The role of social control, social learning, and problem behaviors. *Journal of Youth and Adolescence*, 25, 89-111.
- Crosby, R. A., DiClemente, R. J., Wingood, G. M., Harrington, K., Davies, S., Hook, E. W. III, et al. (2002). Low parental monitoring predicts subsequent pregnancy among African-American adolescent females. *Journal of Pediatric and Adolescent Gynecology*, 15(1), 43-46.
- Crosby, R. A., DiClemente, R. J., Wingood, G. M., Sionean, C., Cobb, B. K., Harrington, K., et al. (2001). Correlates of using dual methods for sexually transmitted diseases and pregnancy prevention among high-risk African-American female teens. *Journal of Adolescent Health*, 28(5), 410-414.
- Crosby, R. A., Salazar, L. F., DiClement, R. J., Yarber, W. L., Caliendo, A. M., & Staples-Horne, M. (2004). Health risk factors among detained adolescent females. *American Journal of Preventive Medicine*, 27(5), 404-410.



- Crowne, D. P. & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349-354.
- Davidson, M. M. (2005). *Adolescent attitudes regarding dating relationships: The construction of sex-specific scales*. Unpublished doctoral dissertation. University of Missouri-Columbia.
- Davis, C., Levitan, R. D., Smith, M., Tweed, S., & Curtis, C. (2006). Associations among overeating, overweight, and attention deficit/hyperactivity disorder: A structural equation modeling approach. *Eating Behaviors*, 7, 266-274.
- Davis, S. M., & Harris, M. B. (1982). Sexual knowledge, sexual interests, and sources of sexual information of rural and urban adolescents from three cultures. *Adolescence*, 17, 471-492.
- Deas-Nesmith, D., Brady, K., White, R., & Campbell, S. (1999). HIV-risk behaviors in adolescent substance abusers. *Journal of Substance Abuse Treatment*, 16(2), 169-172.
- Dervauz, A., Bayle, F. J., Laqueille, X., Bourdel, M., LeBorgne, M., Olie, J., & Krebs, M. (2001). Is substance abuse in schizophrenia related to impulsivity, sensation-seeking, or anhedonia? *American Journal of Psychiatry*, 158(3), 492-494.
- Devine, D., Long, P., & Forehand, R. (1993). A prospective study of adolescent sexual activity: Description, correlates, and predictors. *Advances in Behaviour Research & Therapy*, 15, 185-209.
- DeYoung, M. (1982). *The Sexual Victimization of Children*. Jefferson, NC: McFarland.
- DiClemente, R. J. (1991). Predictors of HIV-preventive sexual behavior in a high-risk adolescent population: The influence of perceived peer norms and sexual communication on incarcerated adolescents' consistent use of condoms. *Journal of Adolescent Health*, 12, 385-390.
- DiClemente, R. J. (Ed.). (1992). Psychosocial determinants of condom use among adolescents. In *Adolescents and AIDS: A generation in jeopardy*. (pp. 34-51). Thousand Oaks, CA: Sage Publications.
- Dilorio, C., Parsons, M., Lehr, S., Adame, D, et al. (1993). Knowledge of AIDS and safer sex practices among college freshmen. *Public Health Nursing*, 10(3), 159-165.
- Dittus, P. J., Jaccard, J., & Gordon, V. V. (1997). The impact of African American fathers on adolescent sexual behavior. *Journal of Youth and Adolescence*, 26(4), 445-465.

- Division of STD Prevention. (2000). *Sexually transmitted disease surveillance 1999*. Atlanta: Department of Health and Human Services, Centers for Disease Control and Prevention.
- Doljanac, R. F., & Zimmerman, M. A. (1998). Psychosocial factors and high-risk sexual behavior: Race differences among urban adolescents. *Journal of Behavioral Medicine, 21*, 451-465.
- Donenberg, G. R., Emerson, E., Bryant, F., Wilson, H., & Weber-Shifrin, E. (2001). Understanding AIDS-risk behavior among adolescents in psychiatric care: Links to psychopathology and peer relationships. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 642-653.
- Donenberg, G. R., Wilson, H. W., Emerson, E., & Bryant, F. B. (2002). Holding the line with a watchful eye: The impact of perceived parental permissiveness and parental monitoring on risky sexual behavior among adolescents in psychiatric care. *AIDS Education and Prevention, 14*(2), 138-157.
- Donohew, L., Zimmerman, R., Cupp, P. S., Novak, S., Colon, S., & Abell, R. (2000). Sensation seeking, impulsive decision-making, and risky sex: Implications for risk-taking and design of interventions. *Personality and Individual Differences, 28*(6), 1079-1091.
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*, 890-904.
- Dornbusch, S. M., Carlsmith, J. M., Bushwall, S. J., Ritter, P. L., Leiderman, H. Hastorf, A. H., et al. (1985). Single parents, extended households and the control of adolescents. *Child Development, 56*, 326-341.
- Dornbusch, S. M., & Gray, K. D. (1988). Single parent families in feminism. In S. M. Dornbusch & M. H. Stober (Eds.), *Children and the New Families* (pp. 274-296). New York: Guilford Press.
- Dryfoos, J. G. (1990). *Adolescents at risk: Prevalence and prevention*. New York: Oxford University Press.
- Duncan, G. J., & Brooks-Gunn, J. (Eds.) (1997). *Consequences of growing up poor*. New York: Russell Sage Foundation.
- East, P. L. (1998). Racial and ethnic differences in girls' sexual, marital, and birth expectations. *Journal of Marriage and Family, 60*, 150-162.
- East, P. L. (1999). The first teenage pregnancy in the family: Does it affect mothers' parenting, attitudes, or mother-adolescent communication? *Journal of Marriage and the Family, 61*(2), 306-319.

- Edirisooriya, G. (1995). Stepwise regression is a problem, not a solution. Paper presented at the Annual Meeting of the Mid-South Educational Research Association.
- Edwards, A. L. (1957). *The social desirability variable in personality assessment and research*. New York: Dryden.
- Elliott, D. S., & Morse, B. J. (1989). Delinquency and drug use as risk factors in teenage sexual activity. *Youth and Society*, 21(1), 32-60.
- Ellis, B. J., Bates, J. E., Dodge, K. A., Fergusson, D. M., Horwood, L. J., Pettit, G. S., et al. (2003). Does father absence place daughters at special risk for early sexual activity and teenage pregnancy? *Child Development*, 74(3), 801-821.
- Elster, A. B., Ketterlinus, R., & Lamb, M. E. (1990). Association between parenthood and problem behavior in a national sample of adolescents. *Pediatrics*, 85, 1044-1055.
- Eng, T., & Butler, W. (Eds). (1997). *The hidden epidemic: Confronting sexually transmitted diseases*. Washington DC: National Academy Press.
- Ensminger, M. E. (1990). Sexual activity and problem behaviors among Black, urban adolescents. *Child Development*, 61, 2032-2046.
- Erikson, E. H. (1975). *Life history and the historical moment*. New York: Norton.
- Ethier, K. A., Kershaw, T., Niccolai, L., Lewis, J. B., & Ickovics, J. R. (2003). Adolescent women underestimate their susceptibility to sexually transmitted infections. *Sexually Transmitted Infections*, 79, 408-411.
- Fergusson, D. M. & Woodward, L. J. (2000). Educational, psychosocial, and sexual outcomes of girls with conduct problems in early adolescence. *The Journal of Child Psychology and Psychiatry*, 41(6), 779-792.
- Finkel, M. L., & Finkel, D. J. (1981). *Public policy and adolescent sexual behavior in the U. S.* Paper presented at the Population Association of America Annual Meeting, Washington, DC.
- Finkelhor, D. (1980). Risk factors in the sexual victimization of children. *Child Abuse and Neglect*, 4, 265-273.
- Fischbein, M., Hennessy, M., Kamb, M., Bolan, G. A., Hoxworth, T., Iatesta, M. et al. (2001). Using intervention theory to model factors influencing behavior change: Project RESPECT. *Evaluating and the Health Professions*, 24(4), 363-384.

- Fisher, L., & Feldman, S. S. (1998). Familial antecedents of young adult health risk behavior: A longitudinal study. *Journal of Family Psychology*, 12, 66-80.
- Flannery, D. J., Rowe, D. C., & Gulley, B. L. (1993). Impact of pubertal status, timing, and age on adolescent experience and delinquency. *Journal of Adolescent Research*, 8, 21-40.
- Focus Adolescent Services. (1999). *The range of teenage sexual behavior*. Retrieved 3/20/07 from <http://www.focusas.com/SexualBehavior.html>.
- Fortenberry, J. D. (1995). Adolescent substance use and sexually transmitted diseases risk: A review. *Journal of Adolescent Health*, 16, 304-308.
- Fox, G. L., & Inazu, J. K. (1980). Patterns and outcomes of mother-daughter communication about sexuality. *Journal of Social Issues*, 36(1), 7-29.
- Franklin, C., Corcoran, J., & Ayers-Lopez, S. (1996). Adolescent pregnancy prevention. In M. W. Fraser (Ed.). *Multisystem risk factors and resilience in childhood*. Washington, DC: NASW Press.
- Fromuth, M. E. (1983). *The long term psychological impact of childhood sexual abuse*. Unpublished doctoral dissertation, Auburn University, Auburn, AL.
- Furman, W., & Shaffer, L. (2003). The role of romantic relationships in adolescent development. In P. Forsheim (Ed.), *Adolescent romantic relations and sexual behavior: Theory, research, and practical implications* (pp.3-22). Mahwah, NJ: Lawrence Erlbaum Associates.
- Furstenberg, F. F. Jr., Brooks-Gunn, J., & Morgan, S. P. (1987). *Adolescent mothers in later life*. New York: Cambridge University Press.
- Garson, G. D. (1998). *Structural equation modeling*. Retrieved 11/20/06 from: <http://www.chass.ncsu.edu/garson/pa765/structur.htm>
- Gastongnay, M. (2004). A full model estimation approach for covariate effects: Inference based on clinical importance and estimation precision. *The AAPS Journal*, 6(4), W4354.
- Gowen, L. K., Feldman, S. S., Diaz, R., & Yisrael, D. S. (2004). A comparison of the sexual behaviors and attitudes of adolescent girls with older versus similar-aged boyfriends. *Journal of Youth and Adolescence*, 33(2), 167-175.
- Graves, K., & Leigh, B. (1995). The relationship of substance use to sexual activity among young adults in the United States. *Family Planning Perspectives*, 27, 18-22.

- Greenberg, J., Magder, L., & Aral, S. (1992). Age at first coitus: A marker for risky sexual behavior in women. *Sexually Transmitted Diseases*, 19(6), 330-334.
- Grolnick, W. S., Deci, E. L., & Ryan, R. M. (1991). The inner resources for school performance: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology*, 83, 508-517.
- Grolnick, W. S., Deci, E. L., & Ryan, R. M. (1997). Internalization within the family. In J. E. Grusec & L. Kuczynski (Eds.), *Parenting and children's internalization of values: A handbook of contemporary therapy* (pp. 135-161). New York: Wiley.
- Grunbaum, J. A., Kann, L., Kinchen, S. A., Williams, B., Ross, J. G., Lowry, R., et al. (2002). Youth risk behavior surveillance. *Morbidity & Mortality Weekly Report, Surveillance Summaries*, 51(SS-4), 1-64.
- Gupta, N., & Mahy, M. (2003). Sexual initiation among adolescent girls and boys: Trends and differentials in sub-Saharan Africa. *Archives of Sexual Behavior*, 32(1), 41-53.
- Hall, E. R., & Flannery, P. J. (1985). Prevalence and correlates of sexual assault experiences in adolescents. *Victimology: An International journal*, 9, 398-406.
- Hamilton, B. E., Martin, J. A., & Sutton, P. D. (2002) Births: Preliminary data for 2002. *National Vital Statistics Reports*, 51(11), 1-20.
- Handler, A. (1990). The correlates of the initiation of sexual intercourse among young urban black females. *Journal of Youth and Adolescence*, 19, 253-264.
- Hanson, S. L., Myers, D. E., & Ginsburg, A. L. (1987). The role of responsibility and knowledge in reducing teenage out-of-wedlock childbearing. *Journal of Marriage and the Family*, 49, 241-256.
- Hardy, J. B., Astone, N. M., Brooks-Gunn, J., Shapiro, S., & Miller, T. L. (1998). Like mother, like child: Intergenerational patterns of age at first birth and associations with childhood and adolescent characteristics and adult outcomes in the second generation. *Developmental Psychology*, 34(6), 1220-1232.
- Harris, J., & Lewis, T. (1986). Control [Recorded by J. Jackson]. On *Control* [CD]. Hollywood: A&M Records.
- Harris, K. M., Duncan, G. J., & Boisjoly, J. (2002). Evaluating the role of "nothing to lose" attitudes on risky behavior in adolescence. *Social Forces*, 80(3), 1005-1039.
- Harris, K. M., & Marmer, J. K. (1996). Poverty, paternal involvement, and adolescent well-being, *Journal of Family Issues*, 17, 614-640.

- Harvey, S. M. & Spigner, C. (1995). Factors associated with sexual behavior among adolescents: A multivariate analysis. *Adolescence*, 30(118), 253-264.
- Hayes, C. (1987). *Risking the future* (Vol. 1). Washington, DC: National Academy Press.
- Hearn, K., O'Sullivan, L., & Dudley, M. (2003). Assessing reliability of early adolescent girls' reports of romantic and sexual behavior. *Archives of Sexual Behavior*, 32(6), 513-521.
- Henricks, L. E., & Montgomery, T. A. (1984). Educational achievement and locus of control among Black adolescent fathers. *Journal of Negro Education*, 53, 182-188.
- Heppner, M. J., Humphrey, C. F., & Hillenbrand-Gunn, T. L. (1995). The differential effects of rape prevention programming on attitudes, behavior, and knowledge. *Journal of Counseling Psychology*, 42(4), 508-518.
- Herman, J. (1981). *Father-daughter incest*. Cambridge, MA: Harvard University Press.
- Herring, L. L. (1985). The effect of family adaptability and cohesion on psychosexual development. [Abstract]. *Dissertation Abstracts International*, 46-03(A), 0806.
- Hockaday, C., Crase, D. J., Shelley, M. C., & Stockdale, D. F. (2000). A prospective study of adolescent pregnancy. *Journal of Adolescence*, 23(4), 423-438.
- Hogan, D. P., & Kitagawa, E. M. (1985). The impact of social status, family structure, and neighborhood on fertility of Black adolescents. *American Journal of Sociology*, 90(4), 825-855.
- Holinger, P. C. (1981). Self-destructiveness among the youth: An epidemiological study of violent deaths. *International Journal of Social Psychiatry*, 27, 277-282.
- Hornberger, L., Rosenthal, S., Biro, F., & Stanberry, L. (1995). Sexual histories of adolescent girls: Comparison between interview and chart. *Journal of Adolescent Health*, 16, 235-239.
- Howard, J. A. (1988). A structural approach to sexual attitudes: Interracial patterns in adolescents' judgments about sexual intimacy. *Sociological Perspectives*, 31(1), 88-121.
- Hunt, C. B. (2002). Genetic polymorphisms associated with the developmental timing of pubertal maturation and subsequent onset of sexual behavior in female adolescents. [Abstract]. *Dissertation Abstracts International*, 63-12(B), 6136.

- Hunter, J. A., Figueredo, A. J., Malamuth, N. M., & Becker, J. V. (2004). Developmental pathways in youth sexual aggression and delinquency: Risk factors and mediators. *Journal of Family Violence, 19*(4), 233-242.
- Ickovics, J. R., Beren, S. E., Grigorenko, E. L., Morrill, A. C., Druley, J. A., & Rodin, J. (2002). Pathways of risk: Race, social class, stress, and coping as factors predicting heterosexual risk behaviors for HIV among women. *AIDS and Behavior, 6*(4), 339-350.
- Jackson, R. C. (2004). Depressive symptoms and sexual risk behaviors in adolescents. [Abstract]. *Dissertation Abstracts International, 65-11*(B), 6033.
- Jacobs, J. E., & Klaczynski, P. A. (2002). The development of judgment and decision making during childhood and adolescence. *Current Directions in Psychological Science, 11*(4), 145-149.
- Jemmott, L. S., & Jemmott, J. B. (1990). Sexual knowledge, attitudes, and risky sexual behavior among inner-city Black male adolescents. *Journal of Adolescent Research, 5*(3), 346-369.
- Jemmott, L. S., & Jemmott, J. B. (1992). Family structure, parental strictness, and sexual behavior among inner-city Black male adolescents. *Journal of Adolescent Research, 7*(2), 192-207.
- Jessor, R. (1991). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Journal of Adolescent Health, 12*, 597-605.
- Jessor, R., Costa, F., Jessor, S. L., & Donovan, J. E. (1983). Time of first intercourse: A prospective study. *Journal of Personality and Social Psychology, 44*, 608-626.
- Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychology, 31*, 923-933.
- Jessor, S. L., & Jessor, R. (1975). Transition from virginity to nonvirginity among youth: A social-psychological study over time. *Developmental Psychology, 11*, 473-484.
- Jessor, S. L., & Jessor, R. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York: Academic Press.
- Joffe, A., & Radius, S. (1993). Self-efficacy and intent to use condoms among entering freshmen. *Journal of Adolescent Health, 14*, 262-268.
- Kann, L., Warren, C. W., Harris, W. A., Collins, J. L., Douglas, K. A., Collins, M. E., et al. (1995). Youth risk behavior surveillance-United States, 1993. *Morbidity and Mortality Weekly Report, 44*, 1-57.

- Keller, S. E., Bartlett, J. A., Schleifer, S. J., Johnson, R. L., Pinner, E., & Delaney, B. (1991). HIV-relevant sexual behavior among a healthy inner-city heterosexual adolescent population in an endemic area of HIV. *Journal of Adolescent Health, 12*, 44-48.
- Kiragu, K., & Zabin, L. (1993). The correlates of premarital sexual activity among school-age adolescents in Kenya. *International Family Planning Perspectives, 19*(3), 92-97.
- Kirby, D. (1984). *Sexuality education: A handbook for the evaluation of programs*. Santa Cruz, CA: Network Publications.
- Kirby, D. (1997). *No easy answers: Research findings on programs to reduce teen pregnancy*. Washington, DC: The National Campaign to Prevent Teen Pregnancy.
- Kirby, D. (2001). *Emerging answers: Research findings on programs to reduce teen pregnancy*. Washington DC: National Campaign to Prevent Teen Pregnancy.
- Kirby, D. (2002). Antecedents of adolescent initiation of sex, contraceptive use, and pregnancy. *American Journal of Health Behavior, 26*(6), 473-485.
- Kirby, D., Short, L., Collins, J., Rugg, D., Kolbe, L., & Howard, M. (1994). School-based programs to reduce sexual risk behaviors: A review of effectiveness. *Public Health Reports, 109*, 339-360.
- Kissinger, P., Fuller, C., Clark, R. A., & Abdalian, S. E. (1997). Psychosocial characteristics of HIV-infected adolescents in New Orleans. *Journal of Adolescent Health, 20*(4), 258.
- Kornreich, J. L., Hearn, K. D., Rodriguez, G., & O'Sullivan, L. F. (2003). Sibling influence, gender roles, and the sexual socialization of urban early adolescent girls. *Journal of Sex Research, 40*(1), 101-110.
- Koss, M. P. (1985). The hidden rape victim: Personality, attitudinal, and situational characteristics. *Psychology of Women Quarterly, 9*, 193-212.
- Koss, M. P., & Dinero, T. E. (1989). Discriminant analysis of risk factors for sexual victimization among a national sample of college women. *Journal of Consulting and Clinical Psychology, 57*(2), 242-250.
- Kotchick, B. A., Shaffer, A., Forehand, R., & Miller, K. S. (2001). Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review, 21*(4), 493-519.



- Kovacs, M., Krol, R. S. M., & Voti, L. (1994). Early onset psychopathology and the risk for teenage pregnancy among clinically referred girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 33(1), 106-113.
- Koyle, P., Jensen, L., Olsen, J. & Cundick, B. (1989). Comparisons of sexual behaviors among adolescents having an early, middle, and late first intercourse experience. *Youth and Society*, 20, 461-475.
- Krull, J. L., & MacKinnon, D. P. (1999). Multilevel mediation modeling in group-based intervention studies. *Evaluation Review*, 23(4), 418-444.
- Ladner, J. (1987). Black teenage pregnancy: A challenge for educators. *Journal of Negro Education*, 56, 53-63.
- Lanctot, N. & Smith, C. A. (2001). Sexual activity, pregnancy, and deviance in a representative urban sample of African American girls. *Journal of Youth and Adolescence*, 30(3), 349-372.
- Langer, L. M., Warheit, G. J., & McDonald, L. P. (2001). Correlates and predictors of risky sexual practices among a multi-racial/ethnic sample of university students. *Social Behavior and Personality*, 29(2), 133-144.
- Last, J. M. (1988). *A dictionary of epidemiology*, (2<sup>nd</sup> ed.). Oxford: Oxford University Press.
- Lederman, C. S., Dakof, G. A., Larrea, M. A., & Li, H. (2004). Characteristics of adolescent females in juvenile detention. *International Journal of Law and Psychiatry*, 27, 321-337.
- Levine, S. B., & Coupey, S. M. (2003). Adolescent substance use, sexual behavior, and metropolitan status: Is "urban" a risk factor? *Journal of Adolescent Health*, 32(3), 350-355.
- Lonning, E. A. (1993). The role of father-daughter relationships on the sexual behavior of the adolescent female. [Abstract]. *Dissertation Abstracts International*, 54-04(A), 1241.
- Lonsway, K. A., & Fitzgerald, L. F. (1994). Rape myths: In review. *Psychology of Women Quarterly*, 18, 133-164.
- Low, S. (2005). Beyond frequency: Close friendship influences on multiple dimensions of adolescent sexual behavior. [Abstract]. *Dissertation Abstracts International*, 66-07B, 3952.

- Lowry, R., Holtzman, D., Truman, B., Kann, L., Collins, J. L., & Kolbe, L. J. (1994). Substance use and HIV-related sexual behaviors among United States high school students: Are they related? *American Journal of Public Health*, 84(7), 116-120.
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996) Power analysis and determination of sample size for covariance structure modeling, *Psychological Methods*, 1(2), 130-149.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2000). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7, 83-104.
- Magnusson, C. (2001). Adolescent girls' sexual attitudes and opposite-sex relations in 1970 and 1996. *Journal of Adolescent Health*, 28, 21-40.
- Mallinckrodt, M., Weis, M., Russell, D. W., & Abraham, T. W. (2006). Advances in testing the statistical significance of mediation effects. *Journal of Counseling Psychology*, 53, 372-378.
- Manlove, J. (1997). Early motherhood in an intergenerational perspective: The experience of a British cohort. *Journal of Marriage and Family*, 59, 263-279.
- Martin, A., Ruchkin, V., Caminis, A., Vermeiren, R. Henrich, C. C., & Schwab-Stone, M. (2005). Early to bed: A study of adaptation among sexually active urban adolescent girls younger than age sixteen. *Journal of the Academy of Child and Adolescent Psychiatry*, 44(4), 358-367.
- Martino, S. C., Collins, R. L., Kanouse, D. E., Elliott, M., & Berry, S. H. (2005). Social cognitive processes mediating the relationship between exposure to television's sexual content and adolescents' sexual behavior. *Journal of Personality and Social Psychology*, 89(6), 914-924.
- Maynard, R. A. (Ed.). (1996). *Kids having kids: A Robin Hood Foundation special report on the costs of adolescent childbearing*. New York: The Robin Hood Foundation.
- McFarlane, M. & St. Lawrence, J. (1999). Adolescents' recall of sexual behavior: Consistency of self-report and effect of variations in recall duration. *Journal of Adolescent Health*, 25(3), 199-206.
- Mcgill, D. A. (2000). Factors that predict a pregnancy risk profile in adolescents: Risk behaviors, perceptions and neighborhood context. [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 60(9-B), 4559.
- McGuire III, E., Shega, J., Nicholls, G., Deese, P., & Landefeld, C. S. (1992). Sexual behavior, knowledge, and attitudes about AIDS among college freshmen. *American Journal of Preventive Medicine*, 8(4), 226-234.

- McLaughlin, C. A., Chen, C., Greenberger, E., & Biermeier, C. (1997). Family, peer, and individual correlates of sexual experience among Caucasian and Asian American late adolescents. *Journal of Research on Adolescence*, 7, 33-53.
- McNair, L. D., Carter, J. A., & Williams, M. K., (1998). Self-esteem, gender, and alcohol use: Relationships with HIV risk perception and behaviors in college students. *Journal of Sex and Marital Therapy*, 24, 29-36.
- Meiselman, K. (1978). *Incest*. San Francisco: Jossey-Bass.
- Mellins, C. A., Brackis-Cott, E., Dolezal, C., & Meyer-Bahlburg, H. F. L. (2005). Behavioral risk in early adolescents with HIV+ mothers. *Journal of Adolescent Health*, 36, 342-351.
- Meschke, L. L., & Silbereisen, R. K. (1997). The influence of puberty, family processes, and leisure activities on the timing of first sexual experience. *Journal of Adolescence*, 20(4), 403-418.
- Metzler, C. W., Noell, J., & Biglan, A. (1992). The validation of a construct of high-risk sexual behavior in heterosexual adolescents. *Journal of Adolescent Research*, 7, 233-249.
- Metzler, C. W., Noell, J., Biglan, A., Ary, D., & Smolkowski, K. (1994). The social context for risky sexual behaviors among adolescents. *Journal of Behavioral Medicine*, 17, 419-438.
- Mezzich, A. C., Tarter, R. E., Giancola, P. R., Lu, S., Kirisci, L., & Parks, S. (1997). Substance use and risky sexual behavior in female adolescents. *Drug and Alcohol Dependence*, 44(2-3), 157-166.
- Michels, T. M., Kropp, R. Y., Eyre, S. L., & Halpern-Felsher, B. L. (2005). Initiating sexual experiences: How do young adolescents make decision regarding early sexual activity? *Journal of Research on Adolescence*, 15(4), 583-607.
- Miller, B., & Moore, K. (1990). Adolescent sexual behavior, pregnancy, and parenting: Research through the 1980s. *Journal of Marriage and the Family*, 52, 1025-1044.
- Miller, B. C. (1998). *Families matter: A research synthesis of family influences on adolescent pregnancy*. Washington, DC: National Campaign to Prevent Teen Pregnancy, Task Force on Effective Programs and Research.
- Miller, B. C., Benson, B., & Galbraith, K. A., (1994). Family relationships and adolescent pregnancy risk: A research synthesis. *Developmental Review*, 21, 1-38.

- Miller, B. C., & Fox, G. L. (1987). Theories of adolescent heterosexual behavior. *Journal of Adolescent Research*, 2, 269-282.
- Miller, B. C., Norton, M. C., Fan, X., & Christopherson, C. R. (1998). Pubertal development, parental communication, and sexual values in relation to adolescent sexual behaviors. *Journal of Early Adolescence*, 18, 27-52.
- Miller, K. E., Farrell, M. P., Barnes, G. M., Melnick, M. J., & Sabo, D. (2005). Gender/racial differences in jock identity, dating, and adolescent sexual risk. *Journal of Youth and Adolescence*, 34(2), 123-136.
- Miller, K. S., Forehand, R., & Kotchick, B. A. (1999). Adolescent sexual behavior in two ethnic minority samples: The role of family variables. *Journal of Marriage and the Family*, 61, 85-98.
- Miller, K. S., Forehand, R., & Kotchick, B. A. (2000). Adolescent sexual behavior in two ethnic minority groups: A multi-system perspective. *Adolescence*, 35(138), 313-333.
- Millstein, S. G., & Moscicki, A. (1995). Sexually transmitted disease in female adolescents: Effects of psychosocial factors and high risk behaviors. *Journal of Adolescent Health*, 17, 83-90.
- Missouri Census Data Center. (2000). *Missouri Census Data Center Demographics from Census 2000*. Retrieved 11/7/06 from <http://mcdc.missouri.edu>.
- Missouri Department of Elementary & Secondary Education. (2005). *Missouri School Directory 2005-2006*. Jefferson City, MO: Author.
- Moore, M. R. (1998). Family and community correlates of sexual debut and pregnancy among African-American female adolescents in high-poverty neighborhoods. [Abstract]. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 59(5-A), 1791.
- Morris, R. E., Baker, C. J., Valentine, M., & Pennisi, A. J. (1998). Variations in HIV risk behaviors of incarcerated juveniles during a four-year period: 1989-1992. *Journal of Adolescent Health*, 23, 39-48.
- Nagin, D. S., Pogarsky, G., & Farrington, D. P. (1997). Adolescent mothers and the criminal behavior of their children. *Law & Society Review*, 31, 137-162.
- National Campaign to Prevent Teen Pregnancy. (1997). *Whatever happened to childhood? The problem of teen pregnancy in the United States*. Washington, DC: Author.

- National Center for Children Exposed to Violence. (2006). Retrieved 3/12/07 from: <http://www.nccev.org/>.
- Nelson, C., & Keith, J. (1990). Comparisons of female and male early adolescent sex role attitude and behavior development. *Adolescence*, 25(97), 183-205.
- Neumark-Sztainer, D., Story, M., French, S. A., & Resnick, M. D. (1997). Psychosocial correlates of health compromising behaviors among adolescents. *Health Education Research*, 12(1), 37-52.
- O'Keefe, M. (1997). Adolescents' exposure to community and school violence: Prevalence and behavioral correlates. *Journal of Adolescent Health*, 20, 368-376.
- Ompad, D. C., Strathdee, S. A., Celentano, D. D., Latkin, C., Poduska, J. M., Kellam, S. G., et al. (2006). Predictors of early initiation of vaginal and oral sex among urban young adults in Baltimore, Maryland. *Archives of Sexual Behavior*, 35(1), 53-65.
- Orr, D., Fortenberry, J., & Blythe, M. (1997). Validity of self-reported sexual behaviors in adolescent women using biomarker outcomes. *Sexually Transmitted Diseases*, 24, 261-266.
- Orr, S. T., Celentano, D. D., Santelli, J., & Burwell, L. (1994). Depressive symptoms and risk factors for HIV acquisition among Black women attending urban health centers in Baltimore. *AIDS Education Prevention*, 6, 230-236.
- Overby, K. J., & Kegeles, S. M. (1994). The impact of AIDS on an urban population of high-risk female minority adolescents: Implications for intervention. *Journal of Adolescent Health*, 15, 216-227.
- Pallant, J. (2006). *SPSS survival manual* (2<sup>nd</sup> ed.). New York: Open University Press.
- Paul, C., Fitzjohn, J., Herbison, P., & Dickson, N. (2000). The determinants of sexual intercourse before age 16. *Journal of Adolescent Behavior*, 27(2), 136-147.
- Paul, W. W., & Pilpel, H. F. (1979). Teenagers and pregnancy: The law in 1979. *Family Planning Perspectives*, 11, 297-302.
- Paulhus, D. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology*, 46, 598-609.
- Paulhus, D. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp.17-59). New York: Academic Press.
- Perrino, T., Gonzalez-Soldevilla, A., Pantin, G., & Szapocnik, J. (2000). *Working with families in the era of HIV/AIDS*. Thousand Oaks, CA: Sage.

- Pilgrim, C. C., Schulenberg, J. E., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (2006). Mediators and moderators of parental involvement on substance use: A national study of adolescents. *Prevention Science*, 7(1), 75-89.
- Podhisita, C., Xenos, P., & Varangrat, A. (2001). The risk of premarital sex among Thai youth: Individual and familial influences. *East-West Center Working Papers*, Number 108-5.
- Preacher, K. J. (2001). Calculation for the chi-square test: An interactive calculation tool for chi-square tests of goodness of fit and independence [Computer software]. Available from <http://www.quantpsy.org>.
- Preacher, K. J. & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717-731.
- Ramrakh, S., Caspi, A., Dickson, N., Moffitt, T. F., & Paul, C. (2000). Psychiatric disorders and risky sexual behavior in young adulthood: Cross sectional study in birth cohort. *British Medical Journal*, 321, 546-551.
- Realityworks. (2006). The effectiveness of infant simulators in teen sexuality and parenting programs. Retrieved 3/26/07 from: [www.realityworks.com/research.html](http://www.realityworks.com/research.html).
- Reiss, A. J., & Roth, J. A. (Eds.). (1993). *Understanding and preventing violence*. Washington, DC: National Academy Press.
- Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. R., Harris, K. M., Jones, J., et al. (1997). Protecting adolescents from harm: Findings from the national longitudinal study on adolescent health. *Journal of the American Medical Association*, 278(10), 823-832.
- Revelle, W. (1987). Personality and motivation: Sources of inefficiency in cognitive performance. *Journal of Research in Personality*, 21, 436-452.
- Reyna, V. F. (2004). How people make decisions that involve risk: A dual-processes approach. *Current Directions in Psychological Science*, 13(2), 60-66.
- Reyna, V. F., & Farley, F. (2006). Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy. *Psychological Science in the Public Interest*, 7(1), 1-44.
- Robbins, C., Kaplan, H. B., & Martin, S. S. (1985). Antecedents of pregnancy among unmarried adolescents. *Journal of Marriage and the Family*, 43, 339-348.

- Robbins, R. J. (1994). *An assessment of perceptions of parental autonomy support and control: Child and parent correlates*. Unpublished doctoral dissertation, Department of Psychology, University of Rochester.
- Robbins, R. N., & Bryan, A. (2004). Relationships between future orientation, impulsive-sensation-seeking, and risk behavior among adjudicated adolescents. *Journal of Adolescent Research, 19*(4), 428-445.
- Robillard, A.G. (2000). Examining the relationship between music videos and sexual risk behavior in African American adolescent females. [Abstract]. *Dissertation Abstracts International, 61-12*(B), 6425.
- Rodgers, K. B. (1995). The relationship between parenting behaviors and sexual risk taking behavior among adolescent males and females. [Abstract]. *Dissertation Abstracts International, 56-07*(A), 2887.
- Romer, D., Black, M., Ricardo, I., Feigelman, S., Kaijee, L., Galbraith, J., et al. (1994). Social influences on the sexual behaviors of youth at risk for HIV exposure. *American Journal of Public Health, 84*, 977-985.
- Romer, D., Hornik, R., Stanton, B., Black, M., Xiannina, L., Ricardo, I., et al. (1997). "Talking" computers: A reliable and private method to conduct interviews on sensitive topics with children. *The Journal of Sex Research, 34*(1), 3-9.
- Romer, D., Stanton, B., Galbraith, J., Feigelman, S., Black, M. M., & Li, S. (1999). Parental influence on adolescent sexual behavior in high-poverty settings. *Archives of Pediatric and Adolescent Medicine, 153*, 1055-1062.
- Rose, A., Koo, H. P., Bhaskar, B., Anderson, K., White, G., & Jenkins, R. R. (2005). The influence of primary caregivers on the sexual behavior of early adolescents. *Journal of Adolescent Health, 37*, 135-144.
- Rosenbaum, E., & Kandel, D. B. (1990). Early onset of adolescent sexual behavior and drug involvement. *Journal of Marriage and the Family, 52*, 783-798.
- Rosenthal, D., Moore, S., & Flynn, I. (1991). Adolescent self-efficacy, self-esteem, and sexual risk-taking. *The Journal of Community and Applied Social Psychology, 1*, 77-88.
- Rosenthal, S., Burlow, K., Biro, F., Pace, L., & DeVellis, R. (1996). The reliability of high-risk adolescent girls' report of their sexual history. *Journal of Pediatric Health Care, 10*, 217-220.
- Rosenthal, T., Muram, D., Tolley, E., Peeler, M., & Pitts, B. (1992). Teenage pregnancy: Predicting the adolescent at risk. *Journal of Sex Education and Therapy, 18*, 277-285.

- Rotheram-Borus, M. J., Rosario, M., Reid, H., & Koopman, C. (1995). Predicting patterns of sexual acts among homosexual and bisexual youths. *American Journal of Psychiatry*, 152, 588-595.
- Rushton, J. P. (1989). Race differences in sexuality and their correlates: Another look and physiological models. *Journal of Research in Personality*, 23, 35-54.
- Rushton, J. P. (1999). Ethnic differences in temperament. In Y. Lee, C. R. McCauley, & J. G. Draguns (Eds.), *Personality and person perception across cultures*. (pp. 45-63). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Rushton, J. P., & Bogaert, A. F. (1987). Race differences in sexual behavior: Testing an evolutionary hypothesis. *Journal of Research in Personality*, 21, 529-551.
- Salazar, L. F., Crosby, R. A., DiClemente, R. J., Wingood, G. M., Lescano, C. M., Brown, L. K., et al. (2005). Self-esteem and theoretical mediators of safer sex among African American female adolescents: Implications for sexual risk reduction interventions. *Health Education and Behavior*, 32(3), 413-427.
- Santelli, J. S., DiClemente, R. J., Miller, K. S., & Kirby, D. (1999). Sexually transmitted diseases, unintended pregnancy, and adolescent health promotion. *Adolescent Medicine*, 10, 87-108.
- Scaramella, L. V., Conger, R. D., Simons, R. L., & Whitbeck, L. B. (1998). Predicting risk for pregnancy by late adolescence: A social contextual perspective. *Developmental Psychology*, 34, 1233-1245.
- Schellenbach, C. J., Whitman, T. L., & Borkowski, J. G. (1992). Toward an integrative model of adolescent parenting. *Human Development*, 35, 81-99.
- Schilling, R. F., El-Bassel, N., Schinke, S. P., & Nichols, S. (1991). Sexual behavior, attitudes toward safer sex, and gender among a cohort of 244 recovering drug users. *International Journal of the Addictions*, 26, 859-877.
- Schvanevelt, P. L., Miller, B. C., Berry, E. H., & Lee, T. R. (2001). Academic goals, achievement, and age at first sexual intercourse: Longitudinal, bi-directional influences. *Adolescence*, 36(144), 767-787.
- Scott-Jones, D., & White, A. B. (1990). Correlates of sexual activity in early adolescence. *Journal of Early Adolescence*, 10, 221-238.
- Seal, A., Minichiello, V., & Omodei, M. (1997). Young women's sexual risk taking behaviour: Re-visiting the influences of sexual self-efficacy and sexual self-esteem. *International Journal of STD and AIDS*, 8(3), 165-172.



- Shrier, L. A., Emans, S. J., Woods, E. R., & DuRant, R. H. (1996). The association of sexual risk behaviors and problem drug behaviors in high school students. *Journal of Adolescent Health, 20*(5), 337-383.
- Shrier, L. A., Harris, S. K., Sternberg, M., & Beardslee, W. R. (2001). Associations of depression, self-esteem, and substance use with sexual risk among adolescents. *Preventive Medicine, 33*, 179-189.
- Sieving, R., Hellerstedt, W., McNeely, C., Fee, R., Snyder, J., & Resnick, M. (2005). Reliability of self-reported contraceptive use and sexual behaviors among adolescent girls. *The Journal of Sex Research, 42*(2), 159-166.
- Small, S. A., & Luster, T. (1994). Adolescent sexual activity: An ecological, risk-factor approach. *Journal of Marriage and Family, 56*, 181-192.
- Smith, C. (1997). Factors associated with early sexual activity among urban adolescents. *Social Work, 42*, 334-345.
- Sobel, M. E. (1982). Asymptomatic intervals for indirect effects in structural equations models. In S. Leinhard (Ed.), *Sociological Methodology 1982* (pp.290-312). San Francisco: Jossey-Bass.
- Somers, C. L., & Paulson, S. E. (2000). Student perceptions of parent-adolescent closeness and communication about sexuality: Relations with sexual knowledge, attitudes, and behaviors. *Journal of Adolescence, 23*, 629-644.
- Stiffman, A., Dore, P., Earls, F., & Cunningham, R. (1992). The influence of mental health problems on AIDS-related risk behaviors in young adults. *Journal of Nervous and Mental Disease, 180*, 314-320.
- Streetman, L. G. (1996). *Drugs, delinquency, and pregnancy: A panel study of adolescent problem behaviors*. New York: Vintage Press.
- Stueve, A., & O'Donnell, L. N. (2005). Early alcohol initiation and subsequent sexual and alcohol risk behaviors among urban youths. *American Journal of Public Health, 95*(5), 887-893.
- Substance Abuse and Mental Health Services Administration. (2006). *SAMHSA model programs: Compare model programs*. Retrieved 10/31/2006 from [http://modelprograms.samhsa.gov/matrix\\_all.cfm](http://modelprograms.samhsa.gov/matrix_all.cfm).
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4<sup>th</sup> Ed.). New York: HarperCollins.

- Tannenbaum, L. R. (2002). Promoting healthy sexual behavior among African American female adolescents: The role of the parent-adolescent relationship. [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 63(6-B), 3028.
- Terry, E., & Manlove, J. (2000). Trends in sexual activity and contraceptive use among teens. *Child Trends Research Brief*. Washington, DC: Child Trends.
- Thompson, L. L., Whitmore, E. A., Raymond, K. M., & Crowley, T. J. (2006). Measuring impulsivity in adolescents with serious substance and conduct problems. *Assessment*, 13(1), 3-15.
- Trickett, E. J. & Zlotlow, S. (1990). Ecology and disordered behavior: An overview of perspectives and assumptions. In P. Leone (Ed.), *Understanding troubled and troubling youth: Multiple perspectives*. Newbury Park, CA: Sage Publications.
- Turbin, M. S., Jessor, R., Costa, F. M., Dong, Q., Zhang, H., & Wang, C. (2006). Protective and risk factors in health-enhancing behavior among adolescents in China and the United States: Does social context matter? *Health Psychology*, 25(4), 445-454.
- Turner, C., Ku, L., Rogers, S., Lindberg, L., Pleck, J., & Sonensein, F. (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. *Science*, 280, 867-873.
- Turner, C. F., Lessler, J. T., & Devore, J. (1992). Effects of mode of administration and wording on reporting drug use. In: Turner, C. F., Lessler, J. T., & Gfroerer, J. C. (Eds.). *Survey measurements of drug use: Methodological studies* (pp.177-220). Washington, DC: U.S. Government Printing Office.
- Turner, R. A., Irwin Jr., C. E., Tschann, J. M., & Millstein, S. G. (1993). Autonomy, relatedness, and the initiation of health risk behaviors in early adolescence. *Health Psychology*, 12(3), 200-208.
- Udry, J. R. (1979). Age at menarche, at first intercourse, and at first pregnancy. *Journal of Biological Sciences*, 11, 411-433.
- Udry, J. R., & Billy, J. O. (1987). Initiation of coitus in early adolescence. *American Sociological Review*, 52, 841-855.
- Udry, J. R., Kovenock, J., & Morris, N. M. (1996). Early predictors of nonmarital first pregnancy and abortion. *Family Planning Perspectives*, 28(3), 113-116.
- United States Census Bureau (2005). *America's families and living arrangements*. Retrieved 11/24/06 from: <http://www.census.gov/population/www/socdemo/hh-fam/cps2005.html>

- Upchurch, D. M., & McCarthy, J. (1990). The timing of a first birth and high school completion. *American Sociological Review*, 55, 224-234.
- Vicary, J. R., Klingaman, L. R., & Harkness, W. L. (1995). Risk factors associated with date rape and sexual assault of adolescent girls. *Journal of Adolescence*, 18, 289-306.
- Walter, H., Vaughan, R., & Cohall, A. (1991). Psychosocial influences on acquired immunodeficiency syndrome and risk behaviors among high school students. *Pediatrics*, 88, 846-852.
- Watts, G. F., & Nagy, S. (2000). Sociodemographic factors, attitudes, and expectations toward adolescent coitus. *American Journal of Health Behavior*, 24(4), 309-317.
- Whitaker, D. J., Miller, K. S., & Clark, L. F. (2000). Reconceptualizing adolescent sexual behavior: Beyond did they or didn't they? *Family Planning Perspectives*, 32, 111-117.
- Whitbeck, L. B., Conger, R. D., & Kao, M. Y. (1993). The influence of parental support, depressed affect, and peers on the sexual behaviors of adolescent girls. *Journal of Family Issues*, 14(2), 261-278.
- Whitbeck, L. B., Conger, R. D., Simons, R. L., & Kao, M. Y. (1993). Minor deviant behavior and adolescent sexual activity. *Youth and Society*, 25(1), 24-37.
- Whitbeck, L. B., Hoyt, D., Miller, M., & Kao, M. (1992). Parental support, depressed affect, and sexual experiences among adolescents. *Youth and Society*, 24, 166-177.
- Wikipedia. (2007). Mediation. Retrieved May 04, 2007, from: <http://www.answers.com/topic/mediation-statistics>
- Wilder, E. I., & Watt, T. T. (2002). Risky parental behavior and adolescent sexual activity at first coitus. *The Milbank Quarterly*, 80(3), 481-524.
- Williams, G. C., Cox, E. M., Hedberg, V. A., & Deci, E. L. (2000). Extrinsic life goals and health-risk behaviors in adolescents. *Journal of Applied Social Psychology*, 30(8), 1756-1771.
- Wingood, G. M., DiClemente, R. J., Bernhardt, J. M., Harrington, K., Davies, S. L., Robillard, A., et al. (2003). A prospective study of exposure to rap music videos and African American female adolescents' health. *American Journal of Public Health*, 93(3), 437-439.

- Wolfe, D. A., Wekerle, C., Scott, K., Straatman, A., Grasley, C., & Reitzel-Jaffe, D. (2003). Dating violence prevention with at-risk youth: A controlled outcome evaluation. *Journal of Counseling and Clinical Psychology, 71*(2), 279-291.
- Woodward, L. J., & Fergusson, D. M. (1999). Early conduct problems and later risk of teenage pregnancy in girls. *Development and Psychopathology, 11*, 127-141.
- Woodward, L. J., Fergusson, D. M., & Horwood, L. J. (2001). Risk factors and life processes associated with teenage pregnancy: Results of a prospective study from birth to 20 years. *Journal of Marriage and the Family, 63*(4), 1170-1184.
- Zermatten, A., Van der Linden, M., d'Acremont, M., Jermann, F., & Bechara, A. (2005). Impulsivity and decision-making. *Journal of Nervous and Mental Disease, 193*(10), 647-650.
- Zuckerman, M. (1971). Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology, 36*, 45-52.
- Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Erlbaum.

## Appendix A

### SCHOOL SOLICITATION EMAIL

Dear Mr. or Ms. \_\_\_\_\_,

My name is Connie Brooks, LPC, and I am a doctoral candidate in the school psychology program at the University of Missouri-Columbia. I work with children and adolescents and am particularly interested in preventing teens from engaging in risky behaviors. This email is in regard to a research project (my dissertation) for which I am seeking your school's participation.

#### ***What does the research entail?***

The research involves gathering data, via a questionnaire, from females, ages 14 through 17. The questionnaire should take approximately 45 minutes to complete and includes questions regarding students' risky behaviors and their beliefs.

#### ***How can the research help my school?***

Once data is obtained, compiled, and analyzed, the results specific to your school will be shared with school administrators/mental health staff to gain a better understanding of girls' perspectives on relationship issues, such as what pressures the girls are dealing with in your community.

Additionally, in exchange for your assistance with the project, a brief in-service regarding environmental risk factors, adolescent females' sexual attitudes and beliefs, and prevention/intervention strategies for risky behaviors (based on the research findings specific to the female teens in your school) will be offered.

#### ***What would the school's role be?***

In order to request participation, I would need contact information for the parents/guardians of female students, ages 14 to 17, to send out information and consent forms. Also, a nonacademic time to administer the questionnaire would be scheduled.

#### ***What else would be good to know before I decide to get more details?***

Data will be collected **anonymously**. Students' names will not be anywhere on the questionnaires, making it impossible to identify individual student responses. School staff would have access to all the documents in the study before deciding whether to participate. Questionnaire wording is similar to that found in high school health class textbooks and what teens typically encounter in everyday life. **Any accommodations to assist the school, parents, and/or students in participating in the project will be considered.**

If you are interested in getting more information before deciding whether to participate, please email or call me at your earliest convenience. I would be happy to answer any questions and forward any documents. If a brief phone or face-to-face meeting would be more convenient, please let me know.

Thank you for your consideration.

Sincerely,

## Appendix B

Smith High School  
1111 Smith Lane  
Columbia, MO. 65211  
(573) 111-2222

Date \_\_\_\_\_

Dear Parent/Guardian,

This letter is regarding a research project conducted through the University of Missouri-Columbia, in which our school is participating. Mr./Ms. \_\_\_\_\_, principal, has reviewed all the materials and approved them to be appropriate for Smith High School students. The primary investigator, Connie Brooks, is asking permission for your daughter (age 14 – 17) to complete a questionnaire regarding female adolescent attitudes and behaviors. Our students' responses will be compiled and shared with school staff in order to help us gain a better understanding of girls' perspectives on sexual issues, such as what pressures the girls are dealing with in our community.

Enclosed you will find a Parental Consent to Participate in Research form for your review. Please read through this information, complete the second page, and return the second page in the enclosed stamped envelope or with your daughter to school. **The deadline for receipt is \_\_\_\_\_.**

Also enclosed is a list of Frequently Asked Questions containing additional information about the project.

Thank you for your consideration.

## **Appendix C**

### **FREQUENTLY ASKED QUESTIONS**

**1. How will the information be used?**

Completed questionnaires from your school, along with responses from other school districts, will be compiled and analyzed. The researcher intends to demonstrate that attitudes and beliefs about sexual behaviors make an impact in whether a child chooses to participate in risky sexual behaviors, despite other factors involved.

**2. How will students' responses remain anonymous?**

Students will NOT put their names anywhere on the forms. Forms will be identified to the researcher by a code, which each student makes up, so that even the researcher cannot identify participants by their forms.

**3. Can I get a copy of my daughter's responses?**

No. Because of the anonymity of the forms, there is no way to determine which forms belong to your daughter. A copy of the overall results will be available upon request.

**4. Will my child miss academic time in class if she participates?**

Absolutely not. Participants will complete the forms during a physical education class, study hall, or other non-academic time.

**5. Is it possible for me to see the survey?**

Yes. A copy of the survey will be kept at the high school office for parent viewing.

**6. How explicit is the questionnaire?**

Questionnaire wording follows the basic language and terms used in high school health books and what teens might normally encounter in everyday life.

**7. How will the research information help the school?**

Once the questionnaires are completed, general information about the pressures facing the female adolescents in your community will be provided to the school, along with suggestions and recommendations for prevention and intervention efforts.

**8. Can my daughter change her mind about participating in the study?**

Absolutely. Participation in the study is completely voluntary and she may choose to quit at any time.

**9. Who can I contact if I have concerns or questions?**

Please contact Connie Brooks, the primary investigator of this research by phone (573) 356-3057 or email (ctbkw8@mizzou.edu). Questions may also be directed to the other contacts listed on your consent form.

## Appendix D

### PARENTAL CONSENT TO PARTICIPATE IN RESEARCH

Connie Brooks, LPC and Rick Short, Ph.D. will be conducting a research project at XXXX High School in the fall of 2006. Ms. Brooks is from the University of Missouri-Columbia and Dr. Short is from Middle Tennessee State University. They are utilizing a questionnaire to help determine the role of attitudes in altering teenage behaviors. This study includes measures of high school students' views of healthy relationships and risky sexual behaviors. They hope that this information can be used to evaluate educational programs about dating and healthy behaviors and relationships. It is important to note that participants will be asked about information pertaining to their attitudes, beliefs and experiences.

Female students of XXXX High School will be asked to fill out the questionnaire along with some additional demographic information. Participation is completely voluntary and each student can choose to participate or not to participate in this project. Additionally, the survey will be completely anonymous and will be kept confidential. Your child's name will NOT be anywhere on the questionnaire.

By participating in the study and filling out the survey, your child will be entered into a raffle, with other students from your school district, to win a \$20.00 cashier's check. Additionally, for returning this consent form (regardless of your response), your child will be entered into a raffle to win an additional \$20.00 cashier's check. Checks will be awarded in mid-November 2006.

Some example items from the survey are the following: (a) It seems like everywhere I look, I am being given messages to have sex; (b) I value guys who treat girls with respect and don't try to play mind games with them; (c) It is OK for a guy to ask his friends to keep tabs (keep track of, keep an eye out) on his girlfriend. By participating in the study, your child is helping provide information to improve prevention efforts of risky sexual behaviors, hopefully preventing many teens from experiencing serious negative consequences of uninformed choices.

If you have any questions, please contact Connie Brooks, LPC, Rick Short, Ph.D., or Richard Cox, Ph.D.

Connie Brooks, LPC: Department of Educational, School, and Counseling Psychology, 16 Hill Hall, University of Missouri-Columbia, MO. 65211  
Phone: 573-884-2131                      Email: ctbkw8@mizzou.edu

Rick Short, Ph.D., Associate Dean: College of Education and Behavioral Sciences, PO Box 93, Middle Tennessee State University, Murfreesboro, TN 37132  
Phone: 615-898-2955    Email: rshort@mtsu.edu

Richard Cox, Ph.D., Department Chair: Department of Educational, School, and Counseling Psychology, 16 Hill Hall, University of Missouri-Columbia, MO 65211  
Phone: 573-882-7602    Email: coxrh@Missouri.edu

For additional information regarding participation in research, please feel free to contact the University of Missouri-Columbia Campus Institutional Review Board office at 573-882-9585 or [umcresearchcirb@missouri.edu](mailto:umcresearchcirb@missouri.edu).



## **PARENTAL CONSENT TO PARTICIPATE IN RESEARCH**

Please complete the following, and return it in the enclosed stamped envelope or with your daughter to school at your earliest convenience. (Deadline for receipt is \_\_\_\_\_).

- ☐ **I give permission for my child to participate in the project.**
- ☐ **I DO NOT give permission for my child to participate in the project**
- ☐ **I'd like more information before I decide.**

**Name:** \_\_\_\_\_

**Daytime phone #:** \_\_\_\_\_

**Evening phone #:** \_\_\_\_\_

**Signed** \_\_\_\_\_ **Date** \_\_\_\_\_

**Child's Name** \_\_\_\_\_

**Child's School** \_\_\_\_\_

## Appendix E

### QUESTIONNAIRE INTRODUCTION NARRATIVE

Before we begin, I'd like to thank all of you for taking time to consider participating in this study. Although your school district has approved participation and your parents have given consent, you have the final say in whether you will participate. So let's talk about that.

Participation involves filling out a questionnaire that will take approximately 45 minutes to complete. Your name will not go anywhere on the forms, so there is no way for anyone to know which responses are yours. Your parents are aware of this fact and know that they cannot be given your individual answers. The questions are about risky behaviors and relationship issues faced by many teenage girls. Responses from your school and several other schools will be combined and analyzed. The analyzed information will be used to help design programs to prevent many teens from experiencing serious negative consequences of uninformed choices.

Let's read through the Youth Assent Form. (*hand out and read Youth Assent Form*)

Before you decide whether to participate, let me stress the fact that your participation is voluntary. You may choose to not answer any particular question and you may end your participation at any time. There is no penalty for changing your mind. Your responses are completely anonymous so no one, not even me, will know which answers are yours.

What questions can I answer? (*discussion*)

If there are no more questions, then those of you who are willing to participate should sign the Youth Assent Form and place it in this envelope. If you have chosen not to participate, please return to your previous classroom/activity.

*Hand out questionnaires and answer questions.*

## Appendix E YOUTH ASSENT FORM

**You are invited to participate in a research study conducted by a graduate student at the University of Missouri-Columbia. As a participant, you should read and understand the following statements. Ask any questions before you agree to participate.**

**1. Goal of the Project:** The goal of this research project is to help determine the role of attitudes in altering teenage behaviors. The information you provide can be used to improve prevention efforts of risky sexual behaviors, hopefully preventing many teens from experiencing serious negative consequences of uninformed choices. The survey asks questions about your attitudes and experiences with sexual behaviors.

**2. Participation Procedure and Guidelines:**

- a. You will receive an assent form (this page), get any questions that you might have answered, and then complete the survey.
- b. The information you provide will be kept **completely anonymous**. That is, your name will not be on any of the forms.
- c. It will take about 45-60 minutes to complete the survey.
- d. By filling out the survey, you will be entered into a raffle to win a \$20.00 cashier's check, to be awarded in mid-November, 2006.

**3. Participation Benefits and Risks:**

- a. Your participation in this study does not involve risks that are greater than those you experience in your daily life. You might feel some mild discomfort from reading and responding to some items on the questionnaires. But again, the risk of discomfort is not greater than you might have in class or in other normal activities.
- b. You also might experience some benefits from participating in this project. These benefits might be positive feelings from helping with an important research study.

**4. Rights to Refuse or Withdraw:** Your participation is VOLUNTARY, and there is no penalty for you not wanting to participate. This means that you are free to stop at any point or to choose not to answer any particular question.

**5. Rights as a Participant:** You have a right to have any questions about this research project answered. Please direct any questions to the following individuals:

Connie Brooks, LPC: Department of Educational, School, and Counseling Psychology, 16 Hill Hall,  
UMC, MO. 65211      Phone: 573-884-2131      Email: ctbkw8@mizzou.edu

Rick Short, Ph.D., Associate Dean: College of Education and Behavioral Sciences, PO Box 93, MTSU,  
Murfreesboro, TN 37132      Phone: 615-898-2955      Email: rshort@mtsu.edu

Richard Cox, Ph.D., Dept. Chair: Department of Educational, School, and Counseling Psychology, 16 Hill  
Hall, UMC, MO 65211      Phone: 573-882-7602      Email: coxrh@missouri.edu

For additional information, please feel free to contact the University of Missouri-Columbia Campus  
Institutional Review Board office at 882-9585 or umcresearchcirb@missouri.edu.

**6. Agreement to Participate:**

Signature \_\_\_\_\_ Date \_\_\_\_\_

## **Appendix F**

### **PARTICIPANT RESOURCES**

Because of the nature of the questions in this project, some participants might feel a bit uncomfortable or be reminded of traumatic events. If you experience either of these, please utilize the following resources:

<http://www.scarleteen.com/cgi-bin/forum/ultimatebb.cgi>

This website contains information about sexual issues common to adolescents. This page in particular is a forum in which you can anonymously submit crisis questions to a trained staff member. You can also participate in less urgent discussions on various topics such as health, nutrition, and relationships as well as an online support group.

<http://www.realsexedfacts.com/index.htm>

Another detailed website containing information about relationship issues specifically designed for teenagers. Includes articles and discussions on sexual abuse, dating etiquette, alternatives to sex, and family relationships.

<http://www.familiesaretalking.org/teen/teen0000.html>

This website includes basic information about relationship safety and choices. Additionally, it has a list of links to organizations that have websites designed to answer relationship-based questions and a list of articles written by teens on different topics, such as AIDS, sex education, media influence, and others.

<http://www.teenwire.com/>

This website contains information about teenage health, relationships, hygiene and more.

<http://www.soc.ucsb.edu/sexinfo/?article=communication&refid=020>

Scenarios and tips for talking with your parents about sexual issues.

The following are some books you might check out:

- I Never Told Anyone: Writings by Women Survivors of Child Sexual Abuse by Ellen Bass (ISBN 0060965738)
- The Gift of Fear by Gavin DeBecker (ISBN 0440226198)
- Invisible Girls: The Truth About Sexual Abuse—A Book for Teen Girls, Young Women, and Everyone Who Cares About Them by Patti Feuereisen & Caroline Pincus (ISBN 1580051359)
- Changing Bodies, Changing Lives: Expanded Third Edition: A Book for Teens on Sex and Relationships by Ruth Bell (ISBN 081292990X)
- It Happened to Me: A Teen's Guide to Overcoming Sexual Abuse by William Lee Carter (ISBN 1572242795)

- Life Strategies for Teens by Jay McGraw (ISBN 074321546X)
  - Don't Sweat the Small Stuff for Teens by Richard Carlson (ISBN 0786885971)
  - Chicken Soup for the Teenage Soul on Tough Stuff: Stories of Tough Times and Lessons Learned by Jack Canfield, Mark Victor Hansen, and Kimberly Kiberger (ISBN 155874942X)
- 

Some movies that may also be of interest:

- The Laramie Project (2001)
  - Odd Girl Out (2005)
  - Thirteen (2002)
  - Child Sexual Abuse: TRUE stories (2002)
- 

Hotlines:

GLBT National Youth Talkline: 1-800-246-PRIDE

National Sexual Abuse Hotline: 1-800-656-HOPE

Planned Parenthood Federation of America: 1-800-230-PLAN

CDC National AIDS/Sexually Transmitted Disease Hotline: 1-800-342-2437

ChildHelp USA: National Child Abuse Hotline: 1-800-422-4453

## Appendix J

**Please make up an identification number for yourself:**

1. Last two letters of your first name (ex: Marie = i.e.) \_\_\_\_\_
2. Month of your birthday (ex: March = 3) \_\_\_\_\_
3. First two letters of your mother's maiden name (ex: Smith = sm) \_\_\_\_\_
4. First letter of the city where you were born (ex: Kansas City = k) \_\_\_\_\_

Write your identification code here: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

## DEMOGRAPHIC QUESTIONNAIRE

Directions: We need your help to understand the factors which made a difference in whether teens participate in risky behaviors. We hope to prevent teens from making unwise decisions and experiencing severe consequences because of that. Please answer the questions **HONESTLY** by circling or indicating which response applies to you. **Your name will not be anywhere on your answer sheets and no one you know will ever see your answers.**

**1. Age:**

13	14	15	16	17	18	19	None apply to me
----	----	----	----	----	----	----	------------------

**2. Year in School:**

9 <sup>th</sup> grade (freshman)	10 <sup>th</sup> grade (sophomore)	11 <sup>th</sup> grade (junior)	12 <sup>th</sup> grade (senior)	None apply to me
-------------------------------------	---------------------------------------	------------------------------------	------------------------------------	------------------

**3. Current Relationship Status:**

<input type="checkbox"/>	single, do not currently have boyfriend/girlfriend and am not dating anyone
<input type="checkbox"/>	casually dating one person, but am not in a committed relationship
<input type="checkbox"/>	casually dating more than one person, but am not in a committed relationship
<input type="checkbox"/>	dating one person exclusively
<input type="checkbox"/>	Engaged
<input type="checkbox"/>	Married

**4. Relationship History:**

<input type="checkbox"/>	never dated anyone
<input type="checkbox"/>	have dated one person
<input type="checkbox"/>	have dated two to five people
<input type="checkbox"/>	have dated more than five people

**5. Racial or ethnic background:**

<input type="checkbox"/>	Black/African American
<input type="checkbox"/>	Asian American or Pacific Islander
<input type="checkbox"/>	Caucasian (White)
<input type="checkbox"/>	Hispanic, Chicano, Latino, or Latina
<input type="checkbox"/>	Native American or American Indian
<input type="checkbox"/>	a mixture of more than one ethnic identification (bi-racial or multi-racial)
<input type="checkbox"/>	other, not listed above

**6. Has your family immigrated to the US in the last five years? No      Yes**

7. Are you eligible for free or reduced lunches at school? No Yes

8. Current family structure:

	Single parent household
	Two parent household (married, no previous marriages)
	Two parent household (married, either one or both parent(s) was previously married)
	Two parent household (not married)
	Live with relatives (NOT parents)
	Live with boyfriend or husband
	Live with multiple households
	Live with friends
	None of the above apply to me

9. What is the highest level of education your mother (or stepmother) obtained:

	junior high school/8 <sup>th</sup> grade or less
	some high school
	finished high school or GED equivalent
	some college or vocational/technical school
	finished four-year college (earned bachelor's degree)
	Master's or professional degree
	Don't know

10. What is the highest level of education your father (or stepfather) obtained:

	junior high school/8 <sup>th</sup> grade or less
	some high school
	finished high school or GED equivalent
	some college or vocational/technical school
	finished four-year college (earned bachelor's degree)
	Master's or professional degree
	Don't know

11. Approximate age when you got your first period:

	younger than 8
	8 or 9 years old
	10 years old
	11 years old
	12 years old
	13 years old or older



For the following questions, sexual intercourse means the male's penis is inside the female's vagina. It is also called 'going all the way' or 'doing it.' Consensual means that you agreed to have sex. In other words, you were not forced to have sex against your will, as is the case with rape or sexual abuse.

**12. Age at first sexual intercourse (consensual):**

	I have not had sexual intercourse
	age 11 or younger
	age 12
	age 13
	age 14
	age 15
	age 16 or older

**13. I have sexual intercourse (consensual) :**

	I have never had sexual intercourse
	one time total
	less than once a month
	1-3 times per month
	more than 3 times per month

**14. I have had a sexually transmitted disease (STD) such as chlamydia, crabs, gonorrhea, herpes, genital warts, etc.**

No Yes

**15. I have been, or currently am, pregnant.**

No Yes

**16. I have had sexual intercourse with:**

	I have not had sexual intercourse and I don't foresee myself being sexually active in the upcoming year
	I have not had sexual intercourse, but I foresee myself being sexually active in the upcoming year
	one sexual partner only
	2, 3, or 4 sexual partners
	5 or more different partners

**17. I have had sexual intercourse in the last six months.**

No Yes

If you answered 'no' to the above question, please go on to the next page.

If you answered 'yes' to the above question, please answer the following.

**How often were condoms used?**

Never seldom always

**How often did you practice safe sex in a way other than with a condom?**

Never                      seldom                      always

**What birth control and/or protection did you and your partner(s) use within the last six months? Please mark all that apply.**

	Nothing
	Condom
	Birth control pills
	Had sex during the “safe” time of the months (rhythm method)
	Withdrawal or “pull out”
	“Morning after” pill
	Depo-Provera (the shot)
	Norplant (small needles in your arm)
	Intrauterine device
	Female condom
	Contraceptive foam, jelly, film
	The patch
	Other (please describe):

## YSR

**Instructions: Below is a list of items that describe kids. For each item that describes you now or within the past 6 months, please circle the 2 if the item is very true or often true of you. Circle the 1 if the item is somewhat or sometimes true of you. If the item is not true of you, circle the 0.**

0 = not true

1 = somewhat or sometimes true

2= very true or often true

18. I act too young for my age.	0	1	2
19. I fail to finish things that I start.	0	1	2
20. I have trouble concentrating or paying attention.	0	1	2
21. I have trouble sitting still.	0	1	2
22. I feel confused or in a fog.	0	1	2
23. I daydream a lot.	0	1	2
24. I act without stopping to think.	0	1	2
25. My schoolwork is poor.	0	1	2

26. I am inattentive or easily distracted.	0	1	2
27. I drink alcohol without my parents' approval.	0	1	2
28. I don't feel guilty after doing something I shouldn't.	0	1	2
29. I break rules at home, school, or elsewhere.	0	1	2
30. I hang around with kids who get in trouble.	0	1	2
31. I lie or cheat.	0	1	2
32. I would rather be with older kids than kids my own age.	0	1	2
33. I run away from home.	0	1	2
34. I set fires.	0	1	2
35. I steal at home.	0	1	2
36. I steal from places other than home.	0	1	2
37. I swear or use dirty language.	0	1	2
38. I think about sex too much.	0	1	2
39. I smoke, chew, or sniff tobacco.	0	1	2
40. I cut classes or skip school.	0	1	2
41. I use drugs for nonmedical purposes ( <b>don't</b> include alcohol or tobacco)	0	1	2

### AARDR

**Instructions:** Using the scale below as a guide, circle the number to the right to indicate how much you agree with it.

0-----1-----2-----3-----4-----5  
 STRONGLY DISAGREE STRONGLY AGREE

42. I was raised to believe that guys should always respect girls when they say they don't want to go further in a relationship.	0	1	2	3	4	5
43.If my boyfriend really loved me, he would want to spend all of his time with me.	0	1	2	3	4	5
44. I value guys who treat girls with respect and don't try to play mind games with them.	0	1	2	3	4	5
45. It is a sign of caring when a guy insists on knowing where his girlfriend is at every moment.	0	1	2	3	4	5

46. I believe that in a relationship, I have the right to set my own limits.	0	1	2	3	4	5
47. When a boyfriend is jealous, it means he cares about the relationship.	0	1	2	3	4	5
48. I have the right to tell my boyfriend what he should wear.	0	1	2	3	4	5
49. Most parents have talked to their teenagers about healthy dating relationships.	0	1	2	3	4	5
50. A girl who has “been with” (hooked up with, messed around with) lots of guys is seen by kids at school as a slut.	0	1	2	3	4	5
51. It is OK for a guy to pressure a girl to drink alcohol or get high to increase his chances of having sex with her.	0	1	2	3	4	5
52. I believe that my boyfriend and I should have the same power to make decisions.	0	1	2	3	4	5
53. I think it is insulting to guys when they are talked about as being unable to control their sexual urges.	0	1	2	3	4	5
54. I think most guys are supportive of girls and want them to be safe and happy.	0	1	2	3	4	5
55. It is OK for a boy’s girlfriend to tell him which girls he can and cannot talk to.	0	1	2	3	4	5
56. I think it is important that guys are not just bystanders when they see a girl in a potentially dangerous situation—they should act to help the girl.	0	1	2	3	4	5
57. It is normal for a girl’s boyfriend to want to know where she is at all times.	0	1	2	3	4	5
58. Please answer “3” for this item.	0	1	2	3	4	5
59. Guys pressure their guy friends into being sexually active.	0	1	2	3	4	5
60. Magazines help girls understand that it is OK to say "no" to a guy.	0	1	2	3	4	5
61. The old double standard still exists—guys who have sex are seen as studs, girls who have sex are seen as sluts.	0	1	2	3	4	5
62. Sometimes it is OK for a guy to hit his girlfriend if she really provokes him.	0	1	2	3	4	5
63. I think a lot more people say they are sexually active than actually are.	0	1	2	3	4	5
64. In movies, girls are shown as wanting to be forced into sex.	0	1	2	3	4	5
65. I believe that in our society, men should be responsible for stopping rape.	0	1	2	3	4	5
66. The peer pressure to <u>not</u> be a virgin is very strong.	0	1	2	3	4	5
67. Just because a guy hits his girlfriend once does not mean he will do it again.	0	1	2	3	4	5
68. Girls are just as entitled to what they want in a relationship as guys are.	0	1	2	3	4	5
69. Guys getting a little physically rough with girls is just a normal part of dating relationships.	0	1	2	3	4	5

70. Scoring with as many girls as possible makes guys more popular.	0	1	2	3	4	5
71. It is OK when a guy continues to touch a girl's body, even when she has pushed his hand away.	0	1	2	3	4	5
72. Being a guy means being tough.	0	1	2	3	4	5
73. Girls respect guys who lay down the law to them.	0	1	2	3	4	5
74. The people in my neighborhood demonstrate healthy relationships.	0	1	2	3	4	5
75. I believe that sexual coercion is more about power and control and less about sex.	0	1	2	3	4	5
76. I believe that in our society, men cause rape.	0	1	2	3	4	5
77. I am reading each item carefully.	0	1	2	3	4	5
78. Music videos show girls wanting to be forced into sex.	0	1	2	3	4	5
79. It seems like everywhere I look, I am being given messages to have sex.	0	1	2	3	4	5
80. Guys and girls get raised differently about how they are supposed to act in dating relationships.	0	1	2	3	4	5
81. Violence is such a big part of our society and becomes a part of many people's relationships.	0	1	2	3	4	5
82. "Real men" respect women.	0	1	2	3	4	5
83. In our society, most sexual assaults happen between people who know each other.	0	1	2	3	4	5
84. It is not coercive when guys keep asking girls over and over to do more sexual things with them.	0	1	2	3	4	5
85. TV programs show that girls who don't have sex and wait for their "true love" are better than girls who date more and do more sexually.	0	1	2	3	4	5
86. Wanting to know your boyfriend's class and work schedules is a normal part of relationships.	0	1	2	3	4	5
87. It is OK for a girl's boyfriend to tell her which guys she can and cannot talk to.	0	1	2	3	4	5
88. I see most guys as supporters of girls—if girls are in danger, they try to help.	0	1	2	3	4	5
89. There are some good reasons why using physical force (hitting or slapping) is necessary in dating relationships.	0	1	2	3	4	5
90. Religious values help teenagers determine what they will do sexually.	0	1	2	3	4	5
91. It is OK for a guy to ask his friends to keep tabs (keep track of, keep an eye out) on his girlfriend.	0	1	2	3	4	5

92. The lyrics of today's songs make me feel like everyone is sexually active.	0	1	2	3	4	5
93. Girls who get hit (slapped, kicked) by their boyfriends do something to deserve it.	0	1	2	3	4	5
94. Girls say "no" a few times to doing sexual things, but eventually they say "yes."	0	1	2	3	4	5
95. It is OK if guys tell girls they "love them" or "care about them" so that girls will mess around with them (french kissing, touching private parts, oral sex).	0	1	2	3	4	5
96. I believe that if my boyfriend really respects me, he will want me to make my own decisions.	0	1	2	3	4	5
97. Please answer "2" for this item.	0	1	2	3	4	5
98. A guy who has "been with" (hooked up with, messed around with) lots of girls is seen by kids at school as a slut.	0	1	2	3	4	5
99. It is OK for a guy to have sex with a girl even if she does not actually say "yes."	0	1	2	3	4	5
100. If a girl really likes a guy, she will always want to be touching him	0	1	2	3	4	5
101. If a guy is drunk and forces a girl to have sex, he can't be blamed for his actions.	0	1	2	3	4	5
102. Girls pressure their girl friends to be sexually active.	0	1	2	3	4	5
103. It is never OK to use physical force (hitting, slapping) in a dating relationship.	0	1	2	3	4	5
104. If a girl gets drunk or high at a party, it's her own fault if a guy pushes himself on her sexually.	0	1	2	3	4	5
105. My family has instilled values in me about dating relationships and sexual behavior.	0	1	2	3	4	5
106. Calling a boyfriend nasty names (ugly, bastard) is not coercive.	0	1	2	3	4	5
107. If a guy and girl are dating and they have had sex before, then the girl should always have sex with the guy if he wants to.	0	1	2	3	4	5
108. Girls tease guys sexually and that explains why girls get forced to do things they don't want to do.	0	1	2	3	4	5
109. Guys can stop during sexual activity even if they are very aroused.	0	1	2	3	4	5
110. If a girl initiates kissing a guy, then she wants to have sex with him.	0	1	2	3	4	5
111. It is OK for a guy to pressure a girl to drink alcohol or get high to increase his chances of making out with her.	0	1	2	3	4	5
112. I believe that if a girl really respects her boyfriend, she will want him to make	0	1	2	3	4	5

his own decisions.						
113. While girls say they want a sensitive guy, they really like the “bad boys.”	0	1	2	3	4	5
114. When I hang out with my friends, we often talk about sexual things like making out, hooking up, having sex, etc.	0	1	2	3	4	5
115. I am paying close attention to these items.	0	1	2	3	4	5
116. It is important to me to really care for someone before doing much with them sexually.	0	1	2	3	4	5
117. It is OK for a girl to ask her friends to keep tabs (keep track of, keep an eye out) on her boyfriend.	0	1	2	3	4	5
118. If a girl is not listening to her boyfriend, it is okay if he holds her down, grabs her arm, etc.	0	1	2	3	4	5
119. When a guy gets jealous when his girlfriend is talking to another guy, it shows he really likes her.	0	1	2	3	4	5
120. If a guy really likes you, he will always want to be touching you.	0	1	2	3	4	5
121. A guy can control his sexual behavior no matter how excited he is.	0	1	2	3	4	5
122. A good boyfriend would not pressure his girlfriend to have sex.	0	1	2	3	4	5
123. Being a girl means having to do things you don't want to do in order to be liked.	0	1	2	3	4	5
124. My teachers have taught me to respect myself and my body.	0	1	2	3	4	5
125. Using words to get what you want is a normal part of dating relationships.	0	1	2	3	4	5
126. Guys threaten to break up with girls if girls don't do sexual things with them.	0	1	2	3	4	5
127. “Emotional abuse” or “psychological abuse” is a normal part of dating relationships.	0	1	2	3	4	5
128. Sometimes it is OK to hit a boyfriend if he really provokes you.	0	1	2	3	4	5
129. A strong person doesn't have to have sex to prove anything.	0	1	2	3	4	5
130. Please answer “4” for this item.	0	1	2	3	4	5
131. True friends would respect your choices about sexual behavior and not pressure you.	0	1	2	3	4	5
132. I believe that girls always say no to sex, and that a guy's role is to change their minds.	0	1	2	3	4	5
133. Most teens think about what their parents have taught them when in a sexual situation.	0	1	2	3	4	5

134. I think guys and girls should be allies in preventing rape.	0	1	2	3	4	5
135. A girl who gets drunk or high at a party puts herself in a position to be taken advantage of by a guy.	0	1	2	3	4	5
136. Girls hook up with guys so they won't get teased by guys.	0	1	2	3	4	5

## BIDR-IM

**Instructions: Using the scale below as a guide, circle the number beside each statement to indicate how much you agree with it.**

1-----2-----3-----4-----5-----6-----7  
NOT TRUE                      SOMEWHAT                      VERY TRUE  
TRUE

137. I sometimes tell lies if I have to.	1	2	3	4	5	6	7
138. I never cover up my mistakes.	1	2	3	4	5	6	7
139. There have been occasions when I have taken advantage of someone.	1	2	3	4	5	6	7
140. I never swear.	1	2	3	4	5	6	7
141. I sometimes try to get even rather than forgive and forget.	1	2	3	4	5	6	7
142. I always obey laws, even if I'm unlikely to get caught.	1	2	3	4	5	6	7
143. I have said something bad about a friend behind his or her back.	1	2	3	4	5	6	7
144. When I hear people talking privately, I avoid listening.	1	2	3	4	5	6	7
145. I have received too much change from a salesperson without telling him or her.	1	2	3	4	5	6	7
146. I always declare everything at customs.	1	2	3	4	5	6	7
147. When I was young I sometimes stole things.	1	2	3	4	5	6	7
148. I have never dropped litter on the street.	1	2	3	4	5	6	7
149. I sometimes drive faster than the speed limit.	1	2	3	4	5	6	7
150. I never read sexy books or magazines.	1	2	3	4	5	6	7
151. I have done things that I don't tell other people about.	1	2	3	4	5	6	7
152. I never take things that don't belong to me.	1	2	3	4	5	6	7





169. My mother is often disapproving and unaccepting of me.	1	2	3	4	5	6	7
170. My mother insists upon my doing things her way.	1	2	3	4	5	6	7
171. My mother is not very involved with my concerns.	1	2	3	4	5	6	7
172. My mother is typically happy to see me.	1	2	3	4	5	6	7
173. My mother is usually willing to consider things from my point of view.	1	2	3	4	5	6	7
174. My mother puts time and energy into helping me.	1	2	3	4	5	6	7
175. My mother helps me to choose my own direction.	1	2	3	4	5	6	7
176. My mother seems to be disappointed in me a lot.	1	2	3	4	5	6	7
177. My mother isn't very sensitive to many of my needs.	1	2	3	4	5	6	7

178. My father seems to know how I feel about things.	1	2	3	4	5	6	7
179. My father tries to tell me how to run my life.	1	2	3	4	5	6	7
180. My father finds time to talk with me.	1	2	3	4	5	6	7
181. My father accepts me and likes me as I am.	1	2	3	4	5	6	7
182. My father, whenever possible, allows me to choose what to do.	1	2	3	4	5	6	7
183. My father doesn't seem to think of me often.	1	2	3	4	5	6	7
184. My father clearly conveys his love for me.	1	2	3	4	5	6	7
185. My father listens to my opinion or perspective when I've got a problem.	1	2	3	4	5	6	7
186. My father spends a lot of time with me.	1	2	3	4	5	6	7
187. My father makes me feel very special.	1	2	3	4	5	6	7
188. My father allows me to decide things for myself.	1	2	3	4	5	6	7
189. My father often seems too busy to attend to me.	1	2	3	4	5	6	7
190. My father is often disapproving and unaccepting of me.	1	2	3	4	5	6	7
191. My father insists upon my doing things his way.	1	2	3	4	5	6	7
192. My father is not very involved with my concerns.	1	2	3	4	5	6	7
193. My father is typically happy to see me.	1	2	3	4	5	6	7
194. My father is usually willing to consider things from my point of	1	2	3	4	5	6	7

view.							
195. My father puts time and energy into helping me.	1	2	3	4	5	6	7
196. My father helps me to choose my own direction.	1	2	3	4	5	6	7
197. My father seems to be disappointed in me a lot.	1	2	3	4	5	6	7
198. My father isn't very sensitive to many of my needs.	1	2	3	4	5	6	7

---

## PN

**199. When my friends have sex, they typically do not use a condom.**

False                  True                  Don't know

**200. My friends have had multiple sex partners (more than 3).**

False                  True                  Don't know

**201. My friends have used illegal drugs, such as marijuana.**

False                  True                  Don't know

**202. At least one of my friends has dated someone more than 5 years older than her/him.**

False                  True                  Don't know

**203. My friends seem to get in trouble a lot.**

False                  True                  Don't know

## VITA

Constance Moore Brooks was born January 23, 1972, in Arnold, Missouri. She earned a Bachelor of Arts degree in psychology from the University of Missouri-Columbia in 1996. She continued her education through receipt of a Master of Arts (1998) in teaching degree, with an emphasis in counseling, from Columbia College, and obtained her licensure as a Professional Counselor in 2000. She earned her Ph.D. in School Psychology from the University of Missouri-Columbia in May of 2007. She is married to Aaron Brooks and has one daughter, Peyton.