

**PARENTAL INFLUENCES ON LATE ADOLESCENTS' AUTONOMOUS
MOTIVATION AND SEXUAL RISK KNOWLEDGE AND BEHAVIOR**

by

BETTINA HORNBUCKLE RILEY

CAROL J. DASHIFF, COMMITTEE CHAIR
GWENDOLYN CHILDS
SUSAN DAVIES
LINDA MONEYHAM
TINA SIMPSON
DAVID E. VANCE

A DISSERTATION

Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

BIRMINGHAM, ALABAMA

2011

Copyright by
Bettina Hornbuckle Riley
2011

**PARENTAL INFLUENCES ON LATE ADOLESCENTS' AUTONOMOUS
MOTIVATION, SEXUAL RISK KNOWLEDGE AND BEHAVIOR**

BETTINA HORNBUCKLE RILEY

DOCTOR OF PHILOSOPHY IN NURSING

ABSTRACT

Adolescent risky sexual behavior is associated with unprotected sex, unplanned pregnancy, abortion, and contraction of sexually transmitted diseases (STDs) such as chlamydia, syphilis, gonorrhea, and HIV/AIDS. During their time of transition to adulthood, late adolescents make decisions about their sexual health that may or may not be motivated by parental (mother and father) sexual risk communication and autonomy support. While the adolescent may be physically independent or semi-independent from his/her parents, parents continue to influence their adolescents through past and present endorsement of certain behaviors. This research examined how parent-sexual risk communication and parental autonomy support may individually and collectively influence the late adolescent's sexual risk behavior and sexual risk knowledge through the adolescent's autonomous motivation. Self-determination theory, a theory of motivation, provided the basis for the research, hypotheses, and conceptual model. A quantitative, cross-sectional, correlational-descriptive, path analysis design was used. A convenience sample ($N = 249$) of 19- and 20-year-old males and females was recruited from an urban senior college. Self-report questionnaires were used to assess demographic characteristics and study variables. Hypothesized pathways were tested for the proposed relationships among the participants' perception of parent-adolescent sexual risk communication and parents' support of autonomy, adolescents' sexual risk knowledge, and adolescents' sexual risk behavior, as well as the possible mediation by

adolescents' autonomous motivation. The final trimmed model (GFI = .99) indicated that parental influences of sexual risk communication and autonomy support, directly and indirectly, predicted adolescents' autonomous motivation and sexual risk behavior (standardized coefficient = -.030). No direct or indirect relationship was found between a parental influence and adolescents' sexual risk knowledge. Obviously more research is needed; however, these new findings indicate mothers and fathers contribute uniquely to late adolescent college students' autonomous motivation to avoid sexual risk behaviors. Clinicians should encourage parents to be autonomy supportive when communicating sexual risk health messages to their adolescents.

Keywords: autonomy, autonomy support, autonomous motivation, sexual risk communication, sexual risk behavior, sexual risk knowledge

DEDICATION

Dedicated to the memory of Patrick M. Riley

ACKNOWLEDGMENTS

Thanks to my dissertation committee, especially my chair and advisor, Dr. Carol Dashiff and my statistician, Dr. David Vance.

Thanks to Sigma Theta Tau, Nu Chapter for funding in the amount of \$ 750.00.

TABLE OF CONTENTS

	<i>Page</i>
ABSTRACT.....	<i>iii</i>
DEDICATION.....	<i>v</i>
ACKNOWLEDGMENTS	<i>vi</i>
LIST OF TABLES.....	<i>xi</i>
LIST OF FIGURES	<i>xii</i>
CHAPTER	
1 INTRODUCTION	1
Statement of the Problem.....	9
Significance of the Study.....	14
Purpose of the Study	15
Research Questions and Research Hypotheses.....	17
Conceptual Framework.....	19
Definition of Terms.....	21
Assumptions	23
Summary	24
2 REVIEW OF THE LITERATURE	26
Literature Search.....	26
Design	26
Search Methods.....	27
Parent-Adolescent Sexual Risk Communication	28
Search Strategy	29
Review of Findings.....	30
Summary of the Review of Findings	51
Review of Limitations of the Methods	51
Summary of the Review of Limitations of the Methods.....	58
Autonomy Support from Parents	58
Search Strategy	59
Review of Findings.....	60
Review of Limitations of the Methods	63
Summary	65

Adolescent Autonomous Motivation	66
Search Strategy	67
Review of Findings	68
Review of Limitations of the Methods	71
Summary	73
Adolescent Sexual Risk Knowledge	73
Summary	74
3 METHODOLOGY	75
Design	75
Description of the Sampling Procedure	75
Protection of Human Subjects	77
Recruitment and Data Collection Procedures	78
Data Safety & Integrity	81
Review of the Instruments	81
Demographic Questionnaire	82
Parent-adolescent Sexual Risk Communication	83
Parental Support of Adolescent Autonomy	86
Adolescents' Autonomous Motivation	90
Adolescents' Sexual Risk Knowledge	94
Adolescents' Sexual Risk Behaviors	96
Pilot Study	99
Data Analysis Plan	100
Basics and Data Quality	100
Description of Sample	100
Assessment of Measures	101
Correlation Matrix	101
Path Analysis	102
4 FINDINGS	105
Pilot Study	105
Feasibility of Study Procedures	105
Univariate Analyses	106
Pretest of Study Measures	108
Main Study	111
Preliminary Analysis	111
Study Data Analysis	113
Findings Organized by Hypothesis	132
5 DISCUSSION	147
Sample	147
Assessment of Measures	150
Findings Regarding the Model	152

Parental Influences.....	153
Autonomy Support to Sexual Risk Communication.....	153
Paths Mediated by Adolescent Autonomous Motivation	156
Paths Not Mediated by Adolescents' Autonomous Motivation	161
Adolescent Outcomes of Sexual Risk Behavior and Sexual Risk	
Knowledge.....	162
Summary.....	165
Conclusions.....	166
Limitations	167
Research and Clinical Implications	171
REFERENCES	175
APPENDICES	
A TABLES RELATED TO INTEGRATED LITERATURE REVIEW	198
TABLE 1 PARENT-ADOLESCENT SEXUAL RISK COMMUNICATION	
STUDIES: MAIN FINDINGS.....	199
TABLE 2 PARENT-ADOLESCENT SEXUAL RISK COMMUNICATION	
STUDIES: METHODS.....	206
TABLE 3 PARENT-ADOLESCENT SEXUAL RISK COMMUNICATION	
MEASURES: DESCRIPTIONS.....	208
TABLE 4 PARENT-ADOLESCENT SEXUAL RISK COMMUNICATION	
MEASURES: TOPICS ASSESSED.....	210
TABLE 5 SEXUAL RISK MEASURES: DESCRIPTIONS	
	212
TABLE 6 SEXUAL RISK MEASURES: TOPICS DISCUSSED.....	
	215
TABLE 7 AUTONOMY SUPPORT FROM PARENT(S) STUDIES: MAIN	
FINDINGS.....	217
TABLE 8 AUTONOMY SUPPORT FROM PARENT(S) STUDIES:	
METHODS	219
TABLE 9 ADOLESCENT AUTONOMOUS MOTIVATION STUDIES: MAIN	

FINDINGS.....	220
TABLE 10 ADOLESCENT AUTONOMOUS MOTIVATION STUDIES:	
METHODS.....	221
B DATA COLLECTION SITES – SUPPORT LETTER TEMPLATE.....	222
C IRB APPROVALS.....	224
C – 1 ORIGINAL IRB APPROVAL.....	225
C – 2 RENEWAL #1 IRB APPROVAL	226
D FLYER.....	227
E COVER LETTER FOR QUESTIONNAIRE PACKET	229
F QUESTIONNAIRE PACKETS	232
F – 1 ORIGINAL QUESTIONNAIRE PACKET	233
F – 2 REVISED QUESTIONNAIRE PACKET.....	254
G TRIMMED MODEL OF STANDARDIZED SOLUTIONS	275
H STANDARDIZED DIRECT EFFECTS, INDIRECT EFFECTS, AND TOTAL EFFECTS ON ADOLESCENT SEXUAL RISK BEHAVIOR	277

LIST OF TABLES

<i>Table</i>	<i>Page</i>
1 Pilot Study Sample Characteristics ($N = 14$)	107
2 Pilot Study Measures' Statistics	109
3 Differences Between Participants Retained and Deleted from Study ($N = 309$)	112
4 Sample Characteristics ($N = 249$)	114
5 Measures' and Their Statistical Properties	115
6 Measures' Symmetry and Kurtosis	117
7 Measures' Interpercentiles	118
8 Correlation Matrix	122
9 Covariance Matrix to be Analyzed ($N = 249$)	124
10 Fitted Covariance Matrix ($N = 249$)	128
11 Fit Measures of Baseline and Trimmed Models	130
12 Test for Mediation of Indirect Effects on Sexual Risk Behavior: Examination of Standard Errors and Confidence Intervals	134
13 Test for Mediation of Indirect Effects on Sexual Risk Knowledge: Examination of Standard Errors and Confidence Intervals	139

LIST OF FIGURES

<i>Figure</i>	<i>Page</i>
1 Conceptual Model of Key Concepts	16
2 Pilot Study: Reports of Mothers' and Fathers' Highest Education Level ($N = 28$)	108
3 Main Study: Reports of Mothers' and Fathers' Highest Education Level ($N = 497$)	116
4 Baseline Model of Standardized Solutions	125
5 Trimmed Model of Standardized Solutions	129
6 Trimmed Model of Unstandardized Solutions	133

CHAPTER 1

INTRODUCTION

United States' (U.S.) 15- to 24-year-olds represent 33% of the sexually active population who are between the ages 15- to 44-years-of-age (Mosher, Chandra A, & J., 2005), yet have a disproportionate share of sexual disease. Almost 50% of the 19 million annual sexually transmitted diseases (STDs) (Weinstock, Berman, & Cates, 2004) and 36.2% of the 41,269 annual HIV/AIDS cases (CDC, 2010), involve 15- to 24-year-olds. In addition, U.S. teens (15- to 19-year-olds) have a birth rate of 41.5 births per 1,000 adolescents (Hamilton, Martin, & Ventura, 2010), one of the highest in an industrialized nation. Sixty percent of high school seniors have engaged in sexual intercourse and over 20% of those students have had four or more sexual partners (CDC, 2008). Research aimed at understanding why adolescents who engage in sexual activity shoulder increased health risks (Weinstock et al., 2004) is critical to the assessment and treatment of adolescent health.

In response to published public and governmental priorities to reduce disparities in adolescent health (US, 2000b), researchers have been prompted to form and answer questions addressing how to best reduce and/or to prevent adolescent sexual risk behavior. From a public health perspective, adolescent sexual activity becomes risky when it contributes to the transmission of a STD, including human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), or to an unwanted or untimely pregnancy or abortion (CDC, 2008). Adolescent risky sexual behavior is exhibited by engaging in unprotected oral, anal, or penile/vaginal, sex/sexual intercourse, especially with multiple partners.

Late adolescence, defined as the stage of development from 18- to 20-years-of-age (Elliott & Feldman, 1990), is a particularly vulnerable period for sexual risk as evidenced by its disproportionate share of pregnancy, STDs, and HIV/AIDS (CDC, 2010; Hamilton et al., 2010; Weinstock et al., 2004). Factors contributing to late adolescents' vulnerability for sexual health risk are late adolescents' deficits in sexual risk knowledge (Gerend & Magloire, 2008; Sandfort Jr., 2009), their inexperience with emotional relationships, their initiation or increase in sexual activity (Arnett, 2007), and their propensity toward immediate reward-seeking behavior related to their neuronal brain development (Galvan et al., 2006). Sexual decision-making poses a greater risk for adverse health outcomes among late adolescents compared to adults (Bearinger, Sieving, Ferguson, & Sharma, 2007; Petersen & Leffert, 1995).

Late adolescence is a time of transition to adulthood with increasing independence from parents (Erikson, 1968). Indeed, as late adolescents form adult romantic relationships and take responsibility for their own actions, their sexual behavior decisions are often made outside the presence of other adults, including parents. Currently, with the median ages of marriage and parenthood having risen upward to 25 years of age (Arnett, 2000), the gap between sexual maturity and marital age has been attributed to an increase in adolescent pre-marital sexual activity (Arnett, 2007; Weinstock et al., 2004). Because the late adolescent is exploring sexual relationships without the role constraints of adulthood (i.e., marriage or parenthood) or direct parental monitoring, the possibility of engaging in sexual risk behavior and incurring adverse outcomes increases (Rapsey & Murachver, 2006).

Because they are on the verge of a prolonged period of sexual exposure, it is

increasingly important for late adolescents to have the necessary guidance and information communicated from authority figures, such as, parents, health professionals (i.e., physician, nurse), or sex educators. These authority figures are challenged to provide late adolescents accurate and age-appropriate sexual education and to enable late adolescents to make sexual decisions that are congruent with optimum health.

Knowledge obtained from parental communication, however, may be the only source of potentially uncensored, comprehensive, medically accurate, and timely knowledge about sexual risk compared to other major sources of sexual risk knowledge. Other major sources of sexual risk knowledge that have been self-reported by late adolescents include friends, school, and television (Heisler, 2005). These self-reported major sources of sexual communication have been associated with negative sexual risk outcomes.

Sex-related communication among late adolescents' peers has been associated with the increased likelihood of being sexually active and was a stronger correlate than mother sex-related communication with the late adolescents' sexual attitudes (Lefkowitz & Espinosa-Hernandez, 2007). In addition, sexual risk topics were more limiting with parents versus peers, with abstinence as a more frequent topic with parents than with peers. Parents may avoid topics that they perceive as encouraging sexual activity (Jaccard, Dittus, & Gordon, 2000). Peer influence on sex initiation has also been shown to develop during the time immediately preceding late adolescence. In a study (Busse, Fishbein, Bleakley, & Hennessy, 2010) involving 14- and 16-year-olds who were monitored over two years, those adolescents who frequently communicated with their friends about sex were more likely to initiate sex over the next two years.

Sex education of middle adolescents contributes to the sexual knowledge of late

adolescents. Sexual risk behavior education at high-school is often limited by time allotted to discuss sex-related education and by the sex-related topic(s) discussed, when federal funding or school boards mandate abstinence only education (Kann, TellJohann, & Wooley, 2007). Another limitation of high-school sex-related education is the hierarchy of sex education. For example, in a study of male and female adolescents, prior to sex initiation, both genders received abstinence instruction before birth control instruction (Lindberg, Santelli, & Singh, 2006). Indeed, a focus group of female late adolescents in college expressed a need for information on sexuality because this information was absent from their health education courses (Kennedy & Roberts, 2009).

Media influence on the late adolescent has been shown to have negative effects on the adolescent's sexual risk behavior. In a longitudinal study (Chandra et al., 2008), 1,461 teens (12–17 years of age, monitored to 15–20 years of age) who watched more sex-related television were more likely to experience pregnancy before age 20 than those who watched less sex-related television. Another study (Collins et al., 2004), using the first wave of the same data set found that among 1,762 teens (12-17 years of age, monitored at baseline and 1 year later), the more sex-related television watched, the higher the incidence of sexual initiation. Lastly, in a longitudinal study, 1,242 adolescents aged 15- to 20-years-old (Time 2 of a 3 wave study), who listened to more degrading music lyrics about sexual content were more likely to initiate sexual intercourse and progress to more advanced levels of noncoital sexual activity (Martino et al., 2006).

To reduce or change adolescent sexual risk behavior and increase adolescent sexual risk knowledge, researchers have examined strategies to increase or initiate

maternal and paternal influences on adolescents' sexual risk behavior through sexual risk communication. Parents remain authority figures in late adolescence during which the parent can be an important source of support and parents have influenced their adolescent's sexual risk behavior through their prior sexual-risk communication (based on communication delivered between the ages of 10- to 18-years) with their adolescent (Hutchinson & Montgomery, 2007). Authority figures such as parents can influence their adolescents' behavior through a process referred to as socialization (Maccoby, Grusec, & Hastings, 2007); sexual socialization includes parent-adolescent sex communication, the verbal or non-verbal exchange of sexual information between a parent and their adolescent. The goals of parent-adolescent sex communication include the creation of similar attitudes, values, and beliefs about sex in their adolescents (Warren, 1995).

Parent-adolescent sexual risk communication is sex communication that specifically addresses sexual risk content, e.g., content addressing birth control (protection against pregnancy), STDs (including HIV/AIDS), condoms, how to protect oneself from acquiring STDs, postponing or not having sex, peer pressure to have sex, and how to handle sexual pressure (Hutchinson, 2007). Parent-adolescent sexual risk communication has been determined to be associated with late adolescents' healthy sexual behavior (Hutchinson, 2002; Hutchinson & Montgomery, 2007). Furthermore, findings (Clawson & Reese-Weber, 2003) indicate that parent-adolescent sexual risk communication has been associated with both adolescents' healthy sexual behaviors (i.e., using more methods of birth control) and increased sexual risk behaviors (i.e., having been or gotten someone pregnant), indicative of parents communicating about sexual risk behavior in an autonomous and a reactive manner, respectively. It remains unclear how

communication with parents about sexual risk topics might help late adolescents avoid the negative aspects of sexual risk behavior. To unravel the complexity of how parent-adolescent sexual risk communication influences adolescent sexual risk behavior, other influences on adolescent sexual risk behavior need to also be examined. One unique aspect of parental influence yet to be examined is the possible influence of parental autonomy support and parental sexual risk communication on an adolescent's sexual risk behaviors and on an adolescent's autonomous motivation to choose healthy sexual behaviors instead of sexual risk behaviors.

The concepts of parental autonomy support and adolescents' autonomous motivation are borrowed from self-determination theory (SDT) (Deci & Ryan, 2000, 2008; Deci & Vansteenkiste, 2004), a motivational theory. According to the SDT framework, autonomy (urge to experience volition or preference), relatedness (the propensity to connect to others), and competence (desire to be effective) are basic, innate, psychological needs that exist across developmental stages. SDT proposes that when the three basic needs are satisfied, the individual experiences a strong autonomous orientation. These three basic psychological needs are measured by the satisfaction or thwarting of that particular need. Autonomy will be examined here as parental (mother and father) autonomy support; how the satisfaction or thwarting of autonomy affects the adolescent's autonomous motivation is the focus.

Parents provide autonomy support by acknowledging the adolescent's perspective, supporting the adolescent's right to make behavioral choices by promoting independent problem solving, and providing pertinent information to the adolescent in a participatory manner which encourages choice and does not dictate outcomes

(Grolnick & Ryan, 1989). Researchers (Ratelle, Larose, Guay, & Sene'cal, 2005) suggest that autonomy support from parents has a positive role in late adolescents' achievements and was found to predict autonomy in the late adolescent. Adolescent autonomous motivation is believed to be enhanced by support for autonomy which is communicated by significant persons, such as parents (Ryan, Deci, Grolnick, & La Guardia, 2006).

Autonomous motivation is demonstrated when one performs a behavior because it is personally valued and because one feels confident in achieving a chosen behavior (Ryan & Deci, 2000b). The adolescent who is autonomously motivated makes a decision based on the individual's own will, not based on external control exercised by others on the adolescent's behavior. SDT research has shown that autonomous motivation has been associated with healthy outcomes related to risky behavior, such as prolonged attendance and involvement in addiction programs (Ryan, Plant, & O'Malley, 1995), and long term maintenance of weight loss in obese individuals (Williams, Grow, Freedman, Ryan, & Deci, 1996). An example of autonomously motivated sexual behavior would be behavior that is healthy and self-directed, congruent with one's own values, and performed by one who would be competent to engage in the behavior (Ryan & Deci, 2000b). During the transition stage, from no autonomous motivation to achieving autonomous motivation, it is possible for the late adolescent to respond to autonomy support by not engaging in sexual risk behavior without yet being totally autonomously motivated. However, autonomous motivation is the type of motivation most closely tied to health and enduring behaviors. Therefore, both the direct and indirect (with adolescent

autonomous motivation as a mediator) relationships between parent (mother or father) adolescent sexual risk communication, parent (mother or father) autonomy support, and adolescent sexual risk behavior will be examined.

According to SDT, autonomy alone is not adequate to ensure adherence; critical components in achieving sustained maintenance of a health behavior are a sense of relatedness and competence (Ryan, Patrick, Deci, & Williams, 2008). Individuals perceive themselves to be competent about a health behavior change after receiving effective inputs, they feel able to engage in or maintain a specific health behavior change. Parents can provide effective inputs by providing information about sexual risk. While the effect of parent sexual risk communication on adolescent sexual risk knowledge or any knowledge is believed to be a positive one by increasing the competence or skills of the adolescent to engage in a healthy behavior (Ryan et al., 2008), the influence of parental sexual risk communication on adolescent sexual risk knowledge could be positive or negative. Positive influence would be considered if the adolescent received and used effective parental sexual risk knowledge and did not engage in risky sexual behavior by preventing sexual risk behavior or by practicing abstinence; the adolescent was autonomously motivated to not engage in sexual risk behavior after receiving pertinent knowledge about sexual risk and used that knowledge to achieve competence about avoiding sexual risk. A negative influence would be considered if the adolescent had received effective or ineffective parental sexual risk communication and chose to participate in risky sexual behavior because he/she lacked autonomy support or was not autonomously motivated. Therefore, parent-adolescent sexual risk communication (both mother and father) will be examined for its' possible direct and indirect (with

autonomous motivation as a mediator) influences on parental (mother or father) autonomy support, and on adolescents' sexual risk knowledge.

Sexual risk knowledge needs to be examined not only as an outcome variable, but also as an influence on adolescent sexual risk behavior. Therefore, the last relationship examined is the relationship between the late adolescent's sexual risk knowledge and sexual risk behavior.

Statement of the Problem

Numerous statistics support the extent of the problem of adolescent sexual risk outcomes. Adolescent sexual risk outcomes include unplanned pregnancy, contraction of sexually transmitted diseases (STDs) such as HIV/AIDS, and non-use or under-use of protection against pregnancy and sexually transmitted diseases. The U.S. has one of the highest prevalence rates of adolescent pregnancy among industrialized nations (Bearinger et al., 2007; Singh & Darroch, 2000). In 2008, the birth rate was 45.1 per 1,000 for younger teens (15- to 17-year-olds) and 70.7 per 1,000 (Hamilton et al., 2010) for older teens (18- to 19-year-olds). The Centers for Disease Control and Prevention (CDC) also identified the 15- to 24-year-old age group as experiencing the highest rates of chlamydia, which may result in pelvic inflammatory disease, (3,275.8 per 100,000 among 15- to 19-year-old females and 3,179.9 per 100,000 among 20- to 24-year-old females) and gonorrhea (636.8 and 608.6 per 100,000 of 15- to 19-year-old and 20- to 24-year-old females, respectively; 433.6 per 100,000 in the 20- to 24-year-old male population) (CDC, 2009b). Prevalence of Human papillomavirus (HPV), which can lead to cervical cancer, was 35% among 14- to 19-year-old females and 29% among 20- to 29-year-old

females attending STD clinics in 2008. Having a STD is a risk factor for the acquisition of HIV/AIDS. From 2004 to 2007, the estimated number of newly diagnosed cases of HIV/AIDS increased for the age groups from 15- to 24-years-of-age; in 2008 the same age group represented 36.2% of the 41,269 newly diagnosed HIV/AIDS cases, an 8% increase over 2007 (CDC, 2010).

As a result, responsible sexual behavior among adolescents remains at the forefront of public health issues as one of the ten leading health indicators (US, 2000b) in the United States (U.S.). Among the 21 critical objectives identified for adolescents in Healthy People 2010 were four objectives related to adolescent sexual risk behavior: (a) reducing adolescent female pregnancies, (b) reducing the number of HIV infection cases among adolescents and adults, (c) reducing the chlamydia infection rate among adolescents and young adults, and (d) increasing the proportion of sexually active adolescents who use condoms or the proportion of adolescents practicing abstinence from sex.

In the U.S., adolescent sexual risk behaviors are described by the CDC as those behaviors contributing to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS (CDC, 2008). The contributing behaviors were further defined as any one or combination of (a) having had sexual intercourse, (b) having had first sexual intercourse before age 13 years, (c) having had sexual intercourse with four or more persons during their life, (d) being currently sexually active, (e) using condoms, (f) using birth control pills, (g) drinking alcohol or using drugs before last sexual intercourse, (h) having been taught in school about HIV/AIDS, and (i) having been tested for HIV/AIDS. These behaviors are those monitored annually by the CDC as part of the Youth Risk

Behavior Surveillance (YRBS). One sexual behavior, same-sex intercourse, is not tracked among young or middle adolescents by the CDC via the YRBS. However, same-sex intercourse among males and injection drug use by males and females are tracked by the CDC, among varying ages of adolescents and adults, as transmission categories in the CDC's surveillance of HIV infection and AIDS cases in the United States (CDC, 2009a). Males having sex with males account for 56% of HIV/AIDS diagnoses among adolescents and adults. Therefore, intercourse with a male who may have intercourse with another male and intercourse with a suspected intravenous drug user are overlooked sexual risk behaviors among late adolescents.

Late adolescence is a critical period in sexual development with increased exposure to sexual health risks (Rapsey & Murachver, 2006). Late adolescents, who are transitioning from the recreational pleasures of group dating of middle adolescence to that of the emotional and physical intimacy of couple dating during late adolescence, continue to mature physically, although reproductive growth is almost complete. They also begin to think about long-term romantic relationships (Arnett, 2000; Erikson, 1968). The late adolescent is physically and emotionally separate from parents, which provides the opportunity for self-reliance in sexual-related decisions; sexual-related decisions include the choice of sexual partner as well as the method of contraception and protection against STDs and HIV/AIDS. This time of increased responsibility provides the potential for great enjoyment and satisfaction from sex; the benefits of sexual activity are also associated with risks such as increased opportunities for sexual risk behaviors (Rapsey & Murachver, 2006). The outcomes of these sexual risk behaviors could affect the adolescent for their entire life (e.g., unplanned pregnancy and occurrence of sexual

transmitted diseases including HIV/AIDS).

Parental communication about sexual risk has the potential to influence late adolescent motivation, and sexual risk knowledge and behavior. Although late adolescents want parents to be a primary source of sexual information and to advise them about sex, and parents want to provide their adolescent with sexual information (Heisler, 2005), parents may not be effective in communicating about sexual risk. Parents may have discomfort discussing certain topics, lack knowledge and skills, fear encouraging sexual initiation, or have restrictive communication styles (Aquilino & Bragadottir, 2000; DiIorio, Kelley, & Hockenberry-Eaton, 1999; Hockenberry-Eaton, Richman, DiIorio, Rivero, & Maibach, 1996; Jaccard & Dittus, 2000; O'Sullivan, Jaramillo, Moreau, & Meyer-Bahlburg, 1999).

Autonomy development is a fundamental psychosocial task during childhood adolescence (Erikson, 1968) and a psychological component of healthy development demonstrated when one performs a behavior because it is personally valued and because one feels confident in achieving a chosen behavior (Ryan & Deci, 2000b). A recent conceptualization of autonomy (Allen, Hauser, Bell, & O'Connor, 1994) addresses the adolescent's need for autonomy within the context of a warm and affectionate relationship that provides a secure base and promotes exploration of an autonomous role (Allen et al., 1994; Grolnick, Deci, & Ryan, 1997). The adolescent's perception of parents as autonomy supportive in their communication can be negatively associated with risky behavior (Williams, Hedberg, Cox, & Deci, 2000). Thus, failure to address adolescent autonomy needs may result in communication that contributes to sexual risk behavior.

According to health behavior experts (Guilamo-Ramos, Jaccard, Dittus, Gonzalez, & Bouris, 2008), sexual risk knowledge is one component or skill that influences an adolescent's sexual risk behavior. However, it is unclear what knowledge the adolescent may have or require about sexual risk. Some studies have shown that STD knowledge per se does not convey a protective effect against high-risk sexual behavior (Inungu, Mumford, Younis, & Langford, 2009; Shapiro, Radecki, Charchian, & Josephson, 1999). Indeed, STD knowledge was gained only after being infected with an STD (D'Urso, Thompson-Robinson, & Chandler, 2007). In other studies, increased knowledge does not translate into a comprehensive understanding of the disease and its process; gaps in knowledge persisted along with increased vulnerability to STDs (Gerend & Magloire, 2008; Sandfort Jr., 2009). Differences in sexual risk knowledge could contribute to fluctuations in sexual risk behavior. It is, therefore, important to understand a baseline level of knowledge of the maturing late adolescent to gauge whether or not there is a deficit in their sexual risk knowledge, specifically STD knowledge, and how their sexual risk knowledge relates to their sexual risk behavior.

In summary, research has shown that parent-adolescent sexual risk communications (Hutchinson, 2002, 2007) have had both positive and negative relationships with late adolescents' sexual risk behavior and parents' autonomy support has had a positive influence on the late adolescent's autonomous motivation (Ratelle et al., 2005). Yet, it is unknown how parent-sexual risk communication and parental autonomy support may individually and collectively influence the late adolescent's sexual risk behavior and sexual risk knowledge through the adolescent's autonomous motivation.

Significance of the Study

Further research on the relationship between parent-adolescent sexual risk communication, parental autonomy support, adolescent autonomous motivation and adolescent sexual risk knowledge and adolescent sexual risk behavior will help design interventions to increase parents' influence to reduce their late adolescents' sexual risk. It is important to examine parent-adolescent sexual risk communication, since it may differ from other parent-adolescent communication (Kahlbaugh, Lefkowitz, Valdez, & Sigman, 1997). The examination of autonomy support from parents as nurturers of adolescent autonomous motivation will allow assessment of the separate and joint effects of both parental autonomy support and sexual risk communication on late adolescents' sexual risk knowledge and behavior. This study can provide a better understanding of the influences of parents on the sexual socialization as a developmental process.

Examination of the amount of sexual risk communication discussed between parent and adolescent may provide a deeper insight into how parent-adolescent sexual risk communication is associated with adolescent sexual risk behavior and adolescent sexual risk knowledge. Research that tests a conceptual model (see Figure 1) that integrates self determination theory's concepts of parental (mother or father) autonomy support and adolescent autonomous motivation with parental (mother or father) sexual risk communication (mother and father) and adolescent sexual risk knowledge and behavior will promote theory development by advancing the conceptualization of late adolescents' sexual risk knowledge and behavior. The examination of each parent's sexual risk communication and autonomy support may offer further information about the roles that mothers and fathers have in fostering the late adolescent's motivation,

sexual risk knowledge and behavior. A better understanding of the specifics of parental influence through sexual risk communication and autonomy support, and the mediating role of adolescent autonomous motivation, on the adolescent's sexual risk knowledge and behavior may suggest avenues of intervention with parents and late adolescents to increase sexual risk knowledge and reduce sexual risk behavior of the late adolescent. Furthermore, the examination of the late adolescent's sexual risk knowledge can provide insight into the depth of sexual risk knowledge. Gaps in knowledge or misconceptions about specific diseases (Gerend & Magloire, 2008; Inungu et al., 2009) illustrate that further education is necessary to prevent sexually transmitted diseases.

By examining adolescent motivation as a possible mediator of the influence of parent-adolescent sexual risk communication and parent autonomy support on adolescent sexual risk knowledge and behavior, the mechanisms whereby these factors influence adolescent sexual risk knowledge and behavior might be explained.

Purpose of the Study

The aims of this exploratory study were to assess a model (see Figure 1) of parent-adolescent sexual risk communication and parental autonomy support as influences on late adolescents' autonomous motivation, sexual risk knowledge, and sexual risk behavior. The concepts of autonomy support and autonomous motivation were borrowed from SDT (Deci & Ryan, 1985b; Ryan, Deci, & Grolnick, 1995). Adolescent autonomous motivation was proposed as a mediator of the relationships between parents' (mother or father) support of autonomy and parents' (mother or father)

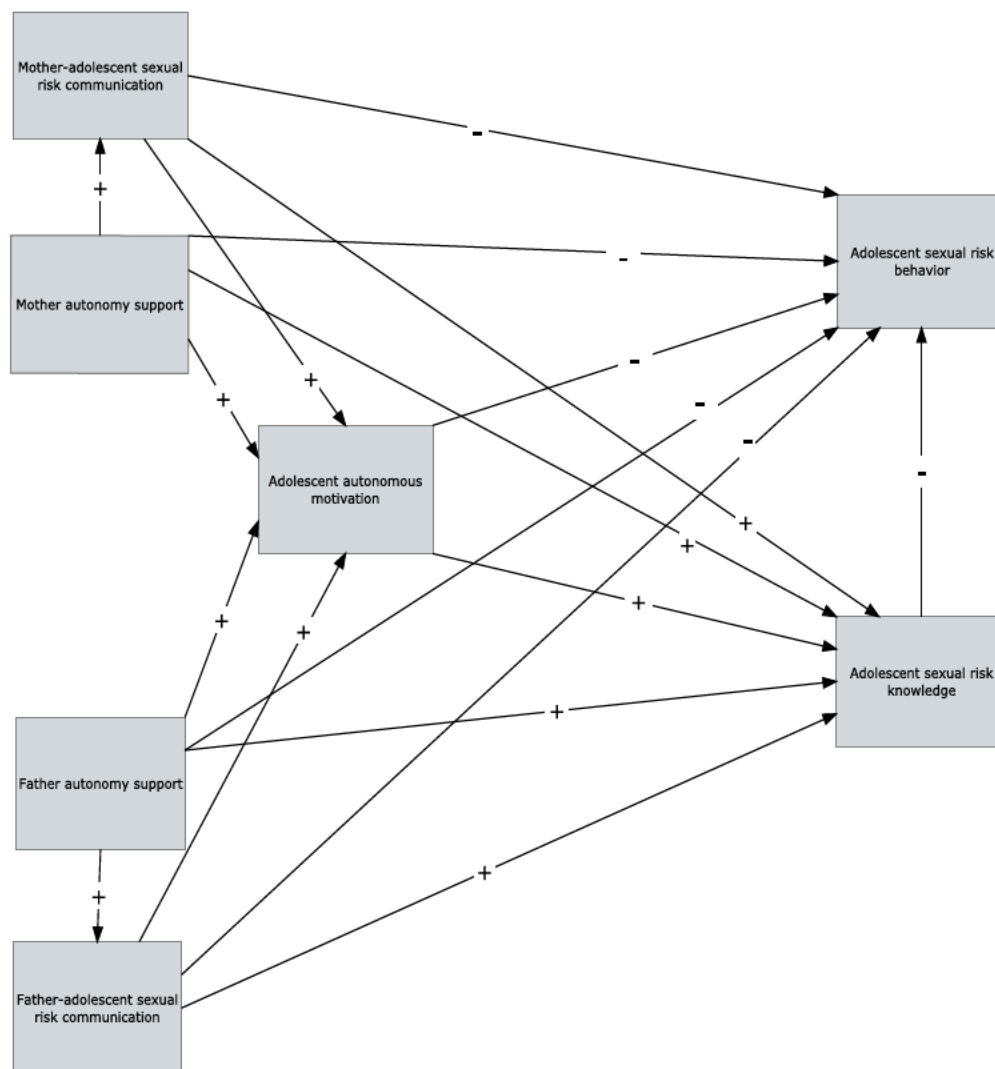


Figure 1. Conceptual Model of Key Concepts.

Note. For the proposed relationships, ‘+’ indicates a positive association, ‘-’ indicates a negative association.

sexual risk communication, and adolescents’ knowledge of sexual risk and sexual risk behavior.

Research Questions and Research Hypotheses

The research questions and research hypotheses in this study were:

1. What is the influence of parents' (mother or father) sexual risk communication on adolescents' sexual risk behavior?
 - a. Parents' (mother or father) sexual risk communication will have a negative relationship with adolescents' sexual risk behavior (see Figure 1).
2. What is the influence of parents' (mother and father) sexual risk communication on adolescents' knowledge of sexual risk?
 - a. Parents' (mother or father) sexual risk communication will have a positive relationship with adolescents' knowledge of sexual risk (see Figure 1).
3. What is the influence of parents' (mother or father) support of autonomy on adolescents' sexual risk behavior?
 - a. Parents' (mother or father) support of autonomy will have a negative relationship with adolescents' sexual risk behavior (see Figure 1).
4. What is the influence of parents' (mother or father) support of autonomy on adolescents' knowledge of sexual risk?
 - a. Parents' (mother or father) support of autonomy will have a positive relationship with adolescents' knowledge of sexual risk (see Figure 1).
5. What is the influence of parents' (mother or father) autonomy support on parents' (mother or father) sexual risk communication?
 - a. Parents' (mother or father) autonomy support will have a positive relationship with parents' (mother or father) sexual risk communication (see Figure 1).
6. Does adolescents' autonomous motivation mediate the proposed negative relationship

- between parents' (mother or father) sexual risk communication and adolescents' sexual risk behavior?
- a. Adolescents' autonomous motivation will mediate the proposed negative relationship between parents' (mother or father) sexual risk communication and adolescents' sexual risk behavior (see Figure 1).
7. Does adolescents' autonomous motivation mediate the proposed positive relationship between parents' (mother or father) sexual risk communication and adolescents' sexual risk knowledge?
- a. Adolescents' autonomous motivation will mediate the proposed positive relationship between parents' (mother or father) sexual risk communication and adolescents' sexual risk knowledge (see Figure 1).
8. Does adolescents' autonomous motivation mediate the proposed negative relationship between parents' (mother or father) autonomy support and adolescents' sexual risk behavior?
- a. Adolescents' autonomous motivation will mediate the proposed negative relationship between parents' (mother or father) autonomy support and adolescents' sexual risk behavior (see Figure 1).
9. Does adolescents' autonomous motivation mediate the proposed positive relationship between parents' (mother or father) autonomy support and adolescents' sexual risk knowledge?
- a. Adolescents' autonomous motivation will mediate the proposed positive relationship between parents' (mother or father) autonomy support and adolescents' sexual risk knowledge (see Figure 1).
 - b. relationship between parents' (mother or father) autonomy support and adolescents' sexual risk knowledge (see Figure 1).

10. What is the influence of adolescents' sexual risk knowledge on adolescents' sexual risk behavior?
- a. Adolescents' sexual risk knowledge will have a negative relationship with adolescents' sexual risk behavior (see Figure 1).

Conceptual Framework

Self-determination theory (SDT) (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) guided this research. SDT is based on an organismic-dialectical meta-theory that envisions the influence of society as facilitating or impeding psychological development (Deci & Ryan, 1985b, 2000; Ryan & Deci, 2000b). SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) focuses on three basic, innate, psychological needs (e.g., autonomy, competence, and relatedness) that contribute to healthy development and functioning. The present study was focused on autonomy in the form of autonomy support from parents (mother or father) and autonomous motivation of the late adolescent.

Interpersonal support for self-determination is referred to as autonomy support (Soenens et al., 2007). Dimensions of autonomy support include providing choice, encouraging self-initiation, acknowledging the other's perspective, and facilitating instead of exercising control (Grolnick et al., 1997); autonomy support has been associated with autonomy in late adolescents (Ratelle et al., 2005), and satisfaction of a basic need, i.e., autonomy, allows the adolescent to experience optimal health and well-being (Ryan, 1995; Williams et al., 2000; Williams et al., 2006). Specifically, when parents are autonomy supportive, i.e., respecting the adolescent's point of view without being controlling, youth have stronger intrinsic values, i.e., direct satisfaction of the three

basic psychological needs of autonomy, competence, and relatedness to others, versus extrinsic values, i.e., satisfaction of external demands such as image, popularity, affluence (Deci & Ryan, 2008). To achieve intrinsic or autonomous motivation, regulations, or behaviors a parent wishes to endorse, such as safe sexual behavior, must be internalized by the adolescent. Thus, internalization of intrinsic values is facilitated by autonomy support (Grolnick et al., 1997).

SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) provides a foundation for addressing important aspects of adolescent development, (i.e., autonomous motivation), and parental influence, (i.e., support of autonomy). The inclusion of parental communication, (i.e., parent-adolescent sexual risk communication) and specific adolescent health outcomes, (i.e., adolescent sexual risk behavior and adolescent sexual risk knowledge) in the model are congruent with SDT (see Figure 1). According to SDT, autonomy supportive parenting enhances adolescent's autonomous motivation, and autonomous motivation allows an individual to experience optimal health outcomes (Ryan, 1995; Williams et al., 2000; Williams et al., 2006). Adolescent sexual risk behavior was examined as an outcome variable associated with non-optimal health, and adolescent sexual risk knowledge was examined as an outcome variable associated with optimal health (the output from autonomy supportive parents as they provide pertinent information). Both outcome variables are consistent with the assessment of a health behavior within the SDT framework.

Research based on SDT, over the last thirty years, has supported positive influences of autonomy support and/or demonstrations of autonomous motivation as a positive mediator in achieving a specified task or reducing an unhealthy behavior. For

example, researchers examined higher academic achievement and prosocial behavior (Ryan & Connell, 1989), improved academic achievement (Grolnick, Ryan, & Deci, 1991), less disruptive behavior at school (Wong, 2008), greater involvement and retention in an alcohol outpatient program (Ryan, Plant et al., 1995), greater motivation to not smoke (Williams, Cox, Kouides, & Deci, 1999), better medication adherence in long-term regimens (Williams, Rodin, Ryan, Grolnick, & Deci, 1998), and better diabetic treatment management (Williams, McGregor, Zeldman, Freedman, & Deci, 2004). It is proposed in this study, that the higher the levels of parental (mother or father) support for autonomy and parental (mother or father) adolescent sexual-risk communication the more positive the association with adolescent autonomous motivation. Adolescent autonomous motivation, in turn, will be positively related to adolescent sexual risk knowledge, and negatively related to adolescent sexual risk behavior (see Figure 1).

Definition of Terms

Adolescence is generally defined as the period from 11- to 20-years-of-age; there are three distinct sub-groups within adolescence (Elliott & Feldman, 1990). The sub-groups are early adolescence (11- to 14-years-of-age), middle adolescence (15- to 17-years-of-age), and late adolescence (18- to 20-years-of-age).

Adolescent autonomous motivation is defined as the motivation to perform an activity spontaneously from an internalization of values (Deci & Ryan, 2008).

Autonomous motivation is demonstrated when one performs a behavior because it is personally valued and because one feels confident in achieving a chosen behavior. For the purposes of this study adolescent autonomous motivation was the score on the

autonomous motivation sub-scale of the Treatment Self-Regulation Questionnaire (Ryan & Connell, 1989; Williams et al., 1996).

Autonomy support from parents is defined as the provision of choice, encouragement of self-initiation, acknowledgement of adolescent perspective by parents, which facilitates self-determined behavior (Grolnick et al., 1997). For the purposes of this study autonomy support from parents was the parent's score from the autonomy sub-scale of the Perceptions of Parents Scales (Robbins, 1994).

Late adolescent is defined as an adolescent who is in a developmental period that involves progression toward adult roles (Petersen & Leffert, 1995). Late adolescents are between the ages of 18 to 20 years (Elliott & Feldman, 1990). For the purposes of this study, late adolescent was operationalized as a youth whose age was 19- to 20-years, who spoke and read English, was unmarried, was not a parent, and who was enrolled during the school year during which the data was collected at the specific institution. The age of 19- to 20-years was chosen to capture the transition period from home to independent style of living (i.e., more freedom for sexual activities; time away from parents' scrutiny and monitoring).

Parent-adolescent sexual risk communication is defined (Hutchinson, 2007) as a component of parent-adolescent sex communication which specifically addresses communication about sexual risk (i.e., protection against unwanted pregnancy, STDs, HIV/AIDS, condoms, safe sex practices, postponing or not having sex, peer pressure to have sex, and how to handle sexual pressure). For the purposes of this study parent-adolescent sexual risk communication was operationalized as scores on the Parent-Teen Sexual Risk Communication Scale III (Hutchinson, 2007).

Parents are defined as the adult figures that the adolescent self-identified as the primary male (father) or female (mother) parenting figure. For the purposes of this study mother will be operationalized by the adolescents' self-report. The response will be a biological mother, stepmother, adoptive mother, foster mother, grandmother, other mother figure, or no mother figure. Father will be operationalized by the adolescents' self-report. The response will be a biological father, stepfather, adoptive father, foster father, grandfather, other father figure, or no father figure.

Sexual risk behavior is defined as those unprotected sexual activities (Kotchick, Shaffer, Forehand, & Miller, 2001) contributing to the transmission of a sexually transmitted disease (STD), including human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), or to an unwanted or untimely pregnancy or abortion (CDC, 2008). Adolescent risky sexual behavior is exhibited by engaging in unprotected oral, anal, or penile/vaginal, sex/sexual intercourse, especially with multiple partners. For the purposes of this study sexual risk behavior was assessed using two sub-scale scores of the Adolescent Risk Inventory (Lescano et al., 2007), specifically, the Sex Risk sub-scale and the Attitude Toward HIV Prevention and Self-efficacy sub-scale.

Sexual risk knowledge is defined as knowledge of sexual risks, including STD types and transmission of STDs, while distinguishing between misinformation or commonly-held beliefs about sexual health (Jaworski & Carey, 2007). Sexual risk knowledge will be operationalized as the score on the STD-Knowledge Questionnaire (Jaworski & Carey, 2007).

Assumptions

Adolescents grow and develop psychologically in a manner integrating

experiences from their environment to achieve a reasoned sense of self (Deci & Ryan, 2000).

There are three innate basic psychological needs, autonomy, competence, and relatedness, that are essential for healthy development, growth, and well-being (Deci & Ryan, 2000).

There are three main types of motivation, amotivation (lack of), extrinsic motivation (based on external values) and, intrinsic or autonomous motivation (based on internal values) (Ryan & Deci, 2000b).

Intrinsically or autonomous motivated behaviors are self-driven (Ryan & Deci, 2000b).

Summary

Sexual risk behavior has been identified as a major health risk of late adolescents (CDC, 2008). Late adolescents are particularly vulnerable to sexual health risk due to extensive opportunities for sexual activity with multiple partners while they are still establishing sexual maturity (Arnett, 2007; Weinstock et al., 2004). Late adolescence is a transition between total parental supervision and adolescent self-reliance (Erikson, 1968). Parents should also transition to be in an autonomy supportive role to enhance the adolescent's autonomous motivation to choose healthy sexual choices. The purpose of this study is to test a model of parental influences (mother autonomy support, father autonomy support, mother-adolescent sexual risk communication, father-adolescent sexual risk communication) on adolescent sexual risk knowledge and adolescent sexual risk behavior that addresses adolescent autonomy and motivation. According to self-

determination theory (SDT) (Deci & Ryan, 1985b; Ryan, Deci et al., 1995), autonomy support from authority figures enhances autonomous motivation and autonomous motivation allows for healthier choices. SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) was adapted to include parent-adolescent sexual risk communication as an independent variable and adolescent sexual risk knowledge and adolescent sexual risk behavior as outcome or dependent variables. Ten research questions and ten related hypotheses were formed to test the conceptual model.

CHAPTER 2

REVIEW OF THE LITERATURE

This review integrated empirical literature about parent-adolescent sexual risk communication, parental autonomy support, and adolescent autonomous motivation that was related to outcomes of sexual risk behavior and sexual risk knowledge of late adolescents. The purposes of this review were to summarize research findings, identify gaps in the research, and evaluate the limitations of the research methods.

Literature Search

Design

The purpose of an integrative review is to present a summary of the research literature about a concept or construct that the consumer can grasp the state of the current research on that concept or construct immediately. The Whitemore and Knafl framework was chosen for this integrative review to allow for inclusion of different methodologies (e.g., quantitative and qualitative) and literature (e.g., theoretical and empirical). The framework provides a rigorous structure for the integrative review organized in five steps. The five steps are problem identification, literature search, data evaluations, data analyses, and synthesized presentation of the findings. The corresponding sections of this chapter are the study variables, parent-adolescent sexual risk communication, parental autonomy support, adolescent autonomous motivation, and their integration with adolescent sexual risk behavior. Sexual risk knowledge was addressed separately because sexual risk knowledge did not emerge when reviewing the

variables of parent-adolescent sexual risk communication, parental autonomy support, and adolescent autonomous motivation.

Search Methods

This integrative literature review was conducted over the last ten years in order to concentrate on the current state of the science related to adolescent sexual risk behavior and knowledge. A computerized database search for published studies focused on parent-adolescent sexual risk communication, parental autonomy support, and adolescent autonomous motivation with emphasis on their relationship to adolescent sexual risk behavior and sexual risk knowledge. The searches were restricted to the inclusion of peer-reviewed, English language research publications that included research participants who were late adolescents. Late adolescents were defined as youth whose age was between 18 to 20 years (Elliott & Feldman, 1990) and who were no longer attending high school. The exclusion of studies in which participants were attending high school reduced confounds of delayed educational progression and more intense parental monitoring that can be associated with high school attendance. In addition, articles were excluded if the research was conducted outside of the U.S., or they used non-U.S. populations, because sex education differs in other countries and this could limit the relevance of findings from these countries to the U.S. (Bearinger et al., 2007).

The databases used were Pub Med, EBSCO Host including Psych Info, CINHALL, ERIC, Health and Psychosocial Instruments, and the following databases in CSA Illumina, Applied Social Sciences Index and Abstracts, Social Services Abstracts, and Sociological Abstracts. An ancestry search was conducted on the bibliographies of the

articles to identify additional studies meeting the inclusion criteria for the review. While studies do exist that address adolescents' sexual risk knowledge (Jaworski & Carey, 2007), no research was located in this literature search which assessed sexual risk knowledge in relation to parent-adolescent sexual risk communication, parental autonomy support, or adolescent autonomous motivation among late adolescents.

Parent-Adolescent Sexual Risk Communication

Parent-adolescent sexual risk communication evolved from the concept of sex education. Since the 1960's, when the dissemination of birth control information was legalized (Warren, 1995) sex education provided by family planning centers, pregnancy prevention centers, and schools, included parents as an important component of the prevention of adolescent pregnancy. Information had been distributed to parents to increase parent-adolescent communication about sexual risk and encourage a parent's role as sex educator (Abbey-Harris & Planned Parenthood Association of Santa Cruz County, 1984; Polulech, Nuttall, & Connecticut Univ, 1988a, 1988b, 1988c, 1988d, 1988e). Abstinence based sex education received major federal funding beginning in 1981, via the Adolescent Family Life Act (AFLA) and received further expansions of funding from 1996 until 2005 (Santelli et al., 2006). Abstinence sex education provided increased resources to community and school programs to encourage parents to talk to their adolescent about the benefits of not having sex, to abstain from having sex.

As parents became a focus of sexual risk communication research during the 1980's (Bearinger et al., 2007; Singh & Darroch, 2000) another health concern evolved, the battle against the HIV/AIDS epidemic (Kippax & Race, 2003). The emergence of

HIV/AIDS in the 1980's prompted intervention and prevention programs to expand parent-adolescent sexual risk communication efforts to include information about the new disease under the auspices of protection and prevention against sexually transmitted diseases (Coyle et al., 1999; DiIorio, McCarty, & Denzmore, 2006; DiIorio, Resnicow et al., 2000; Schuster et al., 2008).

Since the 1980's attempts to involve parents in special programs to increase parent-adolescent sexual risk communication have had modest success (Kirby, Miller, Feldman, & Rosenthal, 2002). Furthermore, there have been mixed findings (Clawson & Reese-Weber, 2003; Hutchinson, 2002; Hutchinson & Montgomery, 2007) about the impact of parent-adolescent sexual risk communication on adolescent sexual risk behavior.

Search Strategy

Keywords used in the search for parent-adolescent sexual risk communication literature were parent (including MESH terms for parent in Pub Med), parent-adolescent, parent-child, parent-teen, adolescent, sex education, and sex communication. Separate searches were conducted on the terms of adolescent sexual risk communication, and adolescent sexual risk knowledge. Articles were included if any of the sexual behaviors that are identified by CDC (2008c), as contributors to sexual risk, addressed parental sexual risk communication (i.e., normative and/or risky sexual topics) and adolescent sexual risk behaviors (i.e., normative and/or risky sexual behaviors). This selection strategy was considered a strong point of the inclusion criteria and enabled the most comprehensive review possible. However, some of the outcomes identified by CDC

(2008c), such as having had sexual intercourse, having used birth control or condoms, or having been tested for HIV/AIDS may be questionable as indicators of sexual risk. Answering questions about having had sexual intercourse does not indicate whether the intercourse was protected from pregnancy or sexually transmitted diseases (STDs), including HIV/AIDS. Having used birth control or condoms, or having been tested for HIV/AIDS could indicate an effort to protect oneself from pregnancy or fathering a child and/or from contracting STDs, including HIV/AIDS.

The searches that met the inclusion criteria yielded nine studies (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley, Lehr, & Soet, 2000; Hutchinson, 1999, 2002; Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr, DiIorio, Dudley, & Lipana, 2000). In three studies (Bynum, 2007; Hutchinson, 1999; Hutchinson & Montgomery, 2007) the assessment of sexual risk is problematic. Perception of HIV risk (Hutchinson, 1999), attitudes about premarital sex (Bynum, 2007; Hutchinson & Montgomery, 2007), attitudes toward engaging in sex and toward using condoms in the next three months and beliefs about difficulties talking to a partner about sexual topics (Hutchinson & Montgomery, 2007) may not actually result in evaluation of sexual risk behavior.

Review of Findings

A description of the purposes and findings from the nine studies reviewed are presented in Tables 1 and 2, Appendix A.

Conceptualization of Parent-Adolescent Sexual Risk Communication

Different approaches were used to examine the influence of parent-adolescent sexual risk communication on adolescents' sexual risk behavior. In the nine studies reviewed (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000), various types of communication, aspects of communication, and perspectives about communication were examined. Various outcomes of sexual risk communication were also addressed. The various outcomes included measurement of adolescents' perception of self-risk for STDs/HIV, attitudes and beliefs about sexual behavior, and risky sexual behaviors. The discussions of findings were organized based on these outcomes.

Communication Approaches Addressed in Studies

Types of communication. Two types of communication were addressed in the studies reviewed, i.e., parent-adolescent sexual risk communication and parent-adolescent general communication. Both types of communication were measured to determine their influences on adolescents' sexual risk. Parent-adolescent sexual risk communication was examined in all nine studies (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000). There were a variety of measures used to assess parent-adolescent sexual risk communication, including topics assessed (see Tables 3 and 4, Appendix A). Parent-adolescent general communication

was also assessed in four of these studies (Bynum, 2007; DiIorio, Dudley et al., 2000; Hutchinson, 2002; Hutchinson & Montgomery, 2007).

Aspects of communication. There was diversity in the aspects of parent sexual risk and general communication that were addressed. The aspects of sexual risk communication that were addressed included amount, frequency, occurrence, openness, and timing (see Table 3, Appendix A). Amount was the quantity of parent-adolescent sexual risk communication delivered by parent(s) to their adolescent(s) as indicated on a Likert scale. The amount of parent-adolescent sexual risk communication was examined in five studies (Clawson & Reese-Weber, 2003; Hutchinson, 1999, 2002; Hutchinson & Montgomery, 2007; Lehr et al., 2000). Frequency was the number of times parents communicated to their adolescent about sexual risk (including those accompanied by written materials and/or videos). Frequency was measured with Likert scales. Frequency was examined in two studies (Bynum, 2007; Kogan et al., 2008). Occurrence was addressed as whether or not parent-adolescent sexual risk communication had happened and was measured dichotomously. Occurrence was addressed in two studies (DiIorio, Dudley et al., 2000; Hutchinson et al., 2003). Openness of the parent-adolescent sexual communication was assessed with a Likert scale and addressed four components of the communication. The four components were whether the communication was delivered in a non-judgmental way, was openly discussed, was age appropriate, and was open to further questions by the adolescent. Openness of sexual communication was assessed in one study (Lehr et al., 2000). Timing of sexual risk communication was whether or not parent-adolescent sexual risk communication had occurred before sexual initiation and

was measured dichotomously. Timing of the parental sexual risk communication was addressed in two studies (Clawson & Reese-Weber, 2003; Hutchinson, 2002). The interaction of the timing and amount of parent-adolescent sexual risk communication in relationship to adolescent sexual risk behavior was examined in one study (Clawson & Reese-Weber, 2003).

The only aspect of adolescents' general communication with parents conceptualized in these studies was the quality of the communication (Bynum, 2007; DiIorio, Dudley et al., 2000; Hutchinson, 2002). The interaction of quality of general communication with parents and timing of the parent-adolescent sexual risk communication in relationship to adolescent sexual risk behavior was examined in one of these studies (Hutchinson, 2002). Quality of general communication with parents was included in a model analysis.

Perspectives about communication. There was variation in whose perspectives about parent-adolescent sexual risk communication were addressed (see Table 3) in the nine studies (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000). Mothers' perspectives were obtained in only one study (Bynum, 2007), where they self-assessed their sexual risk communication to their daughters in one study. In the remaining studies, the adolescents' perspective on sexual risk communication received from each parent individually or combined was obtained. Daughters reported sexual risk communication received from their mothers in one study (Hutchinson et al., 2003), from their mothers and fathers separately in a second study

(Hutchinson, 2002), and from their parents together in a third study (Hutchinson, 1999). Both sons and daughters assessed the sexual risk communication received from their mothers and fathers separately in three studies (Clawson & Reese-Weber, 2003; Hutchinson & Montgomery, 2007; Lehr et al., 2000) and from their parents together in two studies (DiIorio, Dudley et al., 2000; Kogan et al., 2008).

In the four studies that addressed quality of parent-adolescent general communication, one study (Bynum, 2007) addressed daughters' perspectives about quality of general communication from only one parent, their mother. Daughters assessed the quality of general communication from their mothers and fathers separately in a second study (Hutchinson, 2002). Both sons and daughters assessed the quality of general communication from their parents together in a third study (DiIorio, Dudley et al., 2000) and from their mothers and fathers separately in a fourth study (Hutchinson & Montgomery, 2007).

Findings Regarding Sexual Risk

There were three areas of sexual risk outcomes examined across the nine studies reviewed (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000). The three areas were perception of sexual risk, attitudes and beliefs about sexual risk behavior, and sexual risk behavior. Findings related to these areas are examined in this section.

Perception of sexual risk. Hutchinson (1999) studied daughters' perceptions of

self-risk for sexually transmitted diseases (STDs)/HIV as a sexual risk outcome variable. Daughters who reported that parents told them more about STDs, HIV/AIDS, and how to protect themselves from STDs were about 30% less likely to believe that they were at no risk for contracting sexual disease than daughters who reported less parent sexual risk communication. Consistent condom use, satisfaction with present relationship, and the perception that their partner was at no risk were the other predictors of these daughters believing they were at no risk for contracting STDs, including HIV/AIDS. In fact, the perception that their partners were at no risk resulted in daughters being 16 times more likely to view themselves at no risk. Hutchinson (1999) interpreted these findings from a sample of White, African American, Asian, and Hispanic/Latina daughters as important, and explained that past sexual behaviors of a partner may be forgotten in a new relationship as it matures and may lead to a perception of no risk.

Attitudes and beliefs about sexual risk behavior. Attitudes and beliefs about sexual risk behavior were the outcome variables in two studies (Bynum, 2007; Hutchinson & Montgomery, 2007). Attitudes about premarital sex were assessed in two studies and were reported by daughters and their mothers in one study (Bynum, 2007) and by sons and daughters in the other (Hutchinson & Montgomery, 2007). Attitudes about engaging in sex in the next three months, attitudes about using condoms in the next three months, and beliefs about the difficulty talking to a partner(s) about sexual topics were also assessed (Hutchinson & Montgomery, 2007).

In Bynum's study (2007) of African American mothers and their daughters who were transitioning to college, Bynum examined how and if the quality and type of

mother-daughter communication predicted their daughters' premarital sex attitudes and their level of sexual experience. African American daughters who attended historically Black colleges/universities rather than primarily White institutions held more conservative attitudes about premarital sex when their mothers also held conservative attitudes. However, the greater a mothers' frequency of recalled sexual risk communication, the more likely their daughters would have permissive attitudes about premarital sex regardless of school affiliation. Furthermore, mothers' reports of conservative attitudes about premarital sex were unrelated to their daughters' reported levels of sexual experience. Daughters were more likely to engage in sexual activity when their mothers discussed sexual topics more. In addition, daughters reported less sexual experience when their mothers discussed sexual topics less and when they had more good quality general communication with their mothers.

Bynum (2007) stated that the college setting was important in understanding the patterns in the aspects of mother-daughter sexual risk communication and the daughters' sexual attitudes and sexual risk behaviors. In particular, mothers who had daughters enrolled at the historically Black colleges/universities seemed to have more influence on their daughters to have the same belief system as they had than mothers who had daughters enrolled at the primarily White institutions. However, replication of these findings is advisable since only two colleges were involved. In addition, Bynum interpreted these findings as supportive of previous research that found good general communication was important for successful mother-daughter sexual risk communication. Bynum stated that the finding that mothers' conservative attitudes did not predict daughters' actual sexual behavior was due to either limited statistical power

available to test these relationships or to the challenges of a sex ratio imbalance between African American women and men on some college campuses and the ensuing rivalry for African American male sexual partners.

Another explanation for these unexpected findings (Bynum, 2007) could be the limited amount of adolescents' sexual risk behavior measured (see Tables 5 and 6). The sexual activity scale used in Bynum's study only measured the occurrence of a sexual experience registered from "no activity" through "kissing" to having had sexual intercourse. There was no assessment of protected versus unprotected sex nor frequency of intercourse. Since a limited measure of sexual risk behavior was employed, it is possible that the true impact of mother-daughter sexual risk communication on adolescent sexual risk behavior was not captured.

Another factor accounting for these unexpected findings (Bynum, 2007) may be that mothers' perspectives on sexual risk communication rather than adolescents' perspectives were obtained. Daughters' perceptions of mother-daughter sexual risk communication may differ from mothers' perceptions and might be associated with the outcome in the hypothesized direction. Indeed, there have been differences in parents and their late adolescents' perceptions of sexual risk communication (Heisler, 2005); adolescents wanted more open communication even though parents felt they had delivered appropriate sexual risk communication.

In another study with a sample recruited from a historically black university, increased African American mother-daughter, mother-son, and father-daughter sexual risk communication was associated with daughters and sons having had a negative attitude toward unmarried adolescent sexual intercourse and a negative attitude toward

engaging in and being sexually active during the next three months (Hutchinson & Montgomery, 2007). Higher levels of mother-daughter sexual risk communication were associated with lower levels of having had unprotected sex in the past three months and lower levels of ever having been pregnant. In addition, more father-daughter sexual risk communication was associated with daughters having a positive attitude toward condom use in the next three months. In contrast to the Bynum (2007) study, the measure of parental sex communication was assessed by the adolescent and was comprised of specific sexual risk topics. In addition, the sexual behavior measurement included multiple risk items.

Another finding from the Hutchinson and Montgomery study (2007) was that African-American daughters and sons' beliefs that they could talk to a partner about sexual topics was associated with mother-daughter and mother-son sexual risk communication, respectively. Father-son sexual risk communication was also associated with sons' beliefs about increased partner sexual communication; however, father-daughter sexual risk communication was not significantly associated with daughters' beliefs about increased partner sexual communication. While these findings of attitudes and beliefs were limited, findings demonstrated that the attitudes and beliefs of late adolescents are influenced by parent-adolescent sexual risk communication and that sexual communication patterns differed by gender-dyad of adolescent and parent. These findings supported all adolescent-parent dyads as supportive of partner sexual communication, except for father-daughter communication, which did not support increased partner sexual communication. However, African American adolescents'

conservative attitudes and beliefs may not necessarily have a positive influence on their sexual risk behavior outcomes.

Hutchinson and Montgomery (2007) concluded that their findings added to existing research about parent-adolescent sexual risk communication. Specifically, they noted that mother-daughter scores of non-college populations in an earlier study (Hutchinson, 2002) were quite similar to those reported by college students in the current study; however, father-daughter scores were somewhat lower than in the earlier study. Perhaps fathers were not motivated, had less opportunity, or were not available to discuss sexual risk with their daughters who were not attending college.

In summary, building on previous research results, investigators found a relationship between parent-adolescent sexual risk communications and both decreased and increased adolescents' sex risk behaviors. In addition, findings included parent-adolescent sexual risk communication had an important positive relationship with sexual communication with a sexual partner and there was gender dyad specificity of parent-adolescent sexual risk communication. An increase in generalizability of findings was achieved by using a general college population of African American college students. The researchers broadened their sample beyond adolescents who were more vulnerable (Hutchinson et al., 2003) because they were from impoverished inner-city areas and clinics. Using samples from different environments was noted as important in understanding the multiple influences of parent-adolescent sexual risk communication on different groups of African American late adolescent males and females.

Sexual risk behaviors. The third area, i.e., adolescents' sexual risk behaviors,

was examined in eight of the nine studies reviewed (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000). In one study (Hutchinson, 1999), sexual risk behaviors (being tested for HIV/AIDS, number of sexual partners, condom use) reported by daughters were included as predictors of their self-risk perception that they would not contract HIV or other STDs.

There were various measures of sexual risk behaviors used (see Table 5) including variations in the adolescent sexual risk behavior indicators assessed (see Table 6) across all nine studies reviewed (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000). The various adolescent sexual risk behaviors included sexual activity, age of first intercourse, condom use, number of sexual partners, birth control used, having been tested for HIV/AIDS, history of STDs, unprotected intercourse, history of pregnancy, and other topics (see Table 6). Daughters were the participants in four studies (Bynum, 2007; Hutchinson, 1999, 2002; Hutchinson et al., 2003) and daughters and sons were the participants in the other five studies (Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000).

Lehr et al. (2000) used two investigator-designed measures developed to measure parent-adolescent sexual risk communication perceived in college students. The Openness of Sexual Communication Scale and the Sex-Related Communication Scale were used to assess the perceived openness of and amount of parent-adolescent sexual risk communication. More mother-daughter sexual risk communication was associated

with consistent condom use by the African American daughters in this sample, which was equally comprised of White and African American college students; however, sons were more likely to report consistent condom use than females. Both males and females were assessed for consistent condom use and frequency of condom use. These adolescents reported that mothers provided more sexual risk communication than fathers provided. Furthermore, sons reported feeling more comfortable discussing sex with their fathers than mothers, and daughters reported greater openness discussing sexual topics with their mothers than fathers. In addition, White adolescents with the most open and least open mother-adolescent sexual risk communication were both likely to have an early age of sexual initiation. African American adolescents who had the most open and the least open father-adolescent sexual risk communications were both likely to have an early age of sexual initiation. Lehr et al. explained these curvilinear relationships. A lack of guidance or overly strict limitations in families could contribute to an earlier age of adolescent sexual initiation. Lack of guidance would provide a passive method of no support and liberal attitudes would provide an active method of little resistance to earlier adolescent sex initiation. Another explanation offered by Lehr et al. was that parents who were more open and detected their adolescent was about to or had begun to engage in sexual intercourse would initiate sexual communication at the time of sex initiation, while parents who were less open might not know their adolescent was about to or had begun to engage in sexual intercourse and, therefore, would not initiate sexual communication at or around the time of sex initiation. This explanation suggests that in those parents who have more open sex communication with their adolescent, parent-adolescent sexual risk communication is reactive to cues of sexual initiation provided by

the adolescent and not a proactive source of communication, emanating from the parent wanting to prepare their adolescent for sexual encounters by providing them with sexual risk knowledge.

Lehr et al. (2000) concluded that race, gender, and parent-adolescent sexual risk communications were important influences on college students' sexual risk behaviors. Race was the most important predictor of adolescent sexual initiation with African Americans most likely to initiate sex prior to the age of 18 years. Gender was the most important predictor of consistent condom use, with males most likely to report consistent condom use. Females were more likely to report consistent condom use if they had sexual risk communication with their mother. Openness of parent-adolescent sexual communication varied by race with openness of sexual communication with mothers as the most important predictor of sex initiation among White adolescents and openness of communication with fathers as the most important predictor of sex initiation among African Americans adolescents. Lehr et al. were the first investigators to find that fathers were an important source of sexual risk communication among African American older adolescents.

Hutchinson (2002) examined female licensed drivers for the relationship of amount and timing of parent-adolescent sexual risk communication with adolescent sexual risk behaviors. Parent-adolescent sexual risk communication and quality of parental general communication with late adolescents were analyzed by parent-adolescent dyad, separately. However, the discussion of sex with parents prior to sexual initiation was assessed by whether either parent had discussed sex or not.

Three sexual risk behavior outcomes were examined, i.e., initiation of sexual

intercourse, condom use, and occurrence of STDs (Hutchinson, 2002). Findings indicated that on-time parent sexual risk communication and quality of fathers' general communication with their daughters predicted less likelihood of daughters' initiation of sexual intercourse. On-time parent sexual risk communication combined with mothers' discussion of condoms and the quality of mothers' general communication with their daughters predicted daughters' consistent condom use. On-time parent-adolescent sexual risk communication had an indirect effect on adolescents' acquisition of STDs through positive effects of sexual communications on both older ages of sexual initiation and consistent condom use. Daughters' younger age at sexual initiation, lack of consistent condom use prior to age 18 years, and urban residency were predictors of daughters' reports of STDs.

Hutchinson (2002) suggested that on-time sexual risk communication by parents might establish a basis for positive and open sexual communication between parents and their adolescents. Furthermore, this foundation could be used to discuss developmentally appropriate sexual topics throughout adolescence. Regarding father-daughter sexual risk communication, Hutchinson stated fathers were important sources of sexual risk communication and had a role in the sexual socialization of their daughters, in spite of fathers providing little sexual risk information to their daughters. She suggested that this was due to a unique sexual socialization by fathers of their adolescents, particularly daughters, and that this socialization and associated sexual risk communication was inadequately measured.

The moderating effects of race, ethnicity, and growing up in an urban community on the relationship between parent-daughter sexual risk communication and daughters'

sexual risk behaviors were also examined; however, no interaction effects were found (Hutchinson, 2002). Hutchinson attributed the absence of significant interaction effects to small sub-sample sizes and undetected differences. Findings that certain ethnic groups and non-urban adolescents received lesser amounts of parent-adolescent sexual risk communication than other ethnic groups and urban adolescents suggested to Hutchinson that there were norms about patterns of sexual risk communication. Hutchinson elaborated that these patterns of parent-adolescent sexual risk communication may be limited in scope or content because of different ethnic and/or community norms that are particular to the region or country of origin, religious beliefs, and gender of parent and adolescent. Furthermore, Hutchinson stated these patterns could also be attributed to parents being unaware of their adolescents' sexual activity or being complacent about discussion of sexual risks with their currently non-sexually active adolescent.

Clawson and Reese-Weber (2003) examined amount and timing of parent-adolescent sexual risk communication in college students. Clawson and Reese-Weber measured and analyzed sexual risk communication and timing of sexual risk communication separately from mothers and fathers. Adolescents who reported greater parent-adolescent sexual risk communication also reported having an earlier age of first intercourse and having more lifetime sexual partners. In addition, greater mother-adolescent sexual risk communication was associated with adolescents having been or gotten someone pregnant, having been tested for HIV/AIDS and one activity believed to reduce sexual risk taking behavior, using more methods of birth control.

Clawson and Reese-Weber (2003) stated that, although the amount of sexual risk communication by parents was relatively low, increased opportunities for

communication, including communication about sexual risk topics, may exist based on the opportunities afforded by the adolescents' increased sexual risk behaviors. Clawson and Reese-Weber also suggested that the amount of communication might differ by topic. For example, some topics (pregnancy) might be discussed in more detail than other topics (prostitution) which may not be discussed at all.

Clawson and Reese-Weber found that on-time (communication that occurred prior to an adolescent's sexual initiation) parent-adolescent sexual risk communication was associated with the adolescent having been or gotten someone pregnant, but also with adolescent reports of using more methods of birth control and having fewer lifetime sexual partners. When the influence of gender of parent was examined, on-time mother-adolescent sexual risk communication was also associated with adolescents using more methods of birth control. In addition, Clawson and Reese-Weber (2003) examined timing of sexual risk communication by parents as a moderator between amount of parent-adolescent sexual risk communication and adolescents' sexual risk behaviors. Timing of parent-adolescent sexual risk communication only moderated the effects of father-adolescent sexual risk communication on adolescent sexual risk behaviors. Regardless of the amount of father-adolescent sexual risk communication, its interaction with on-time father-adolescent sexual risk communication was associated with the adolescent being older at first intercourse. The interaction of greater amounts of father-adolescent sexual risk communication coupled with off-time father-adolescent sexual risk communication was associated with an older age of adolescent sexual initiation and having been or gotten someone pregnant. The combination of less father-adolescent sexual risk communication and off-time sex communication was associated with a

younger age of adolescent sex initiation. These findings indicate timing of parent-adolescent sexual risk communication contributed to reductions in numerous adolescents' sexual risk behaviors beyond the individual contribution made by the amount of parent-adolescent sexual risk communication.

According to Clawson and Reese-Weber (2003), findings related to father-adolescent sexual risk communication might be explained based on two paternal actions. First, fathers may discuss sex with their younger adolescent based on cues their adolescents demonstrated by their behavior indicating initiation of sex, and, second, that fathers may have seen sex initiation as a normative part of later adolescence and believe that they had already provided the necessary information for their adolescent to make sound sexual decisions. In addition, differences in how mother-adolescent and father-adolescent sexual risk communications were associated with adolescent sexual risk behaviors suggested that the attitudinal tone of the communication and the specific content of the sexual risk communication, as well as whether the parent or adolescents initiated the communication, might represent sub-components of parent-adolescent sexual risk communication that should be assessed separately in future research. Furthermore, Clawson and Reese-Weber suggested that the reason some parents have on-time versus off-time sexual risk communication may be that parenting processes co-vary with timing of sexual risk communication. Parenting processes such as parental monitoring and support might predict which parent would most likely provide on-time sexual risk discussion with their adolescent.

DiIorio, Dudley et al. (2000) examined college-enrolled sons and daughters for factors believed to be associated with safer sex or HIV communication with a sexual

partner. The quality of parent-adolescent general communication and parent-adolescent sexual risk communication were positively associated with each other and with safer sex communication with a partner. In an effort to explain how the variables affected safer sex communication with a partner, Dudley et al. (2000) ran a fully saturated model. The fully saturated model indicated that the occurrence of sex-based communication with parents was directly and positively associated with communication self-efficacy and safer sex communication with a partner; in turn, communication self-efficacy was positively associated with communication outcome expectations, which was positively associated with condom use. The prior positive direct correlation between parent-adolescent sexual risk communication and condom use was no longer evident, but was replaced by an indirect path indicating full mediation through the two variables of communication self-efficacy and safer sex communication with a partner. The direction of the relationship also changed and the path through safer sex communication was negatively associated with condom use, suggestive of multicollinearity between parent-adolescent sexual risk communication and communication self-efficacy and/or safer sex communication with a partner.

Full mediation and the change of direction of the relationship suggested that communication self-efficacy and safer sex communication with a partner were variables in this model that had a significant role in influencing adolescent sexual risk behavior, and that parent-adolescent sexual risk communication should not be the only focus of interventions to prevent or reduce adolescent sexual risk behaviors. While this model was not the only model that could explain the relationships between these variables, the

model supported the complexity of the relationship between parent-adolescent sexual risk communication and adolescent sexual risk behaviors.

Quality of parent-adolescent general communication was directly and positively associated with communication outcome expectations. However, communication outcome expectations were indirectly and negatively related to condom use through a positive relationship with safer sex communication. Quality of parent-adolescent general communication was not directly correlated with condom use.

DiIorio, Dudley et al. (2000) interpreted these complex relationships as supportive of parent-adolescent sexual risk communication and its impact on condom use self-efficacy. DiIorio, Dudley et al. suggested that parent-adolescent sexual risk communication served as a model for discussions about sexual risk with others, i.e., sexual partners, supporting a proposition of social cognitive theory (Bandura, 1986, 1997) that a person's confidence about behavior performance is an important predictor of that behavior.

DiIorio, Dudley et al. (2000) suggested that the negative relationship between safer sex communication with a partner and adolescents' condom use might be a result of adolescents viewing safer sex communication as a form of safer sex. Communication about safer sex might have been substituted for other more effective STD reduction measures, such as condom use. Another influential factor might be the length of adolescent intimate relationships; the longer the relationship the greater the chance of abandonment of condom use due to increased commitment to one another. According to DiIorio, Dudley et al., those who had more positive communication with their parents and partners about safe sex adolescents held more positive outcome expectancies about the

communication, and held the belief that birth control was a safe sex alternative for steady couples such as themselves.

Hutchinson et al. (2003) examined the relationship between mother-daughter sexual risk communication and sexual risk behaviors. Hutchinson et al. found that the occurrence of mother-daughter sexual risk communication in an African American and Hispanic/Latina female sample, recruited from an adolescent medicine clinic, was associated with less number of sexual partners, fewer episodes of sexual intercourse, and less number of days of unprotected sexual intercourse. African American and Hispanic/Latina mothers' discussions of condom use, birth control, and AIDS were the sexual risk topics discussed that were the topics most often associated with lower occurrences of unprotected sexual intercourse in their daughters (Hutchinson et al., 2003). In addition, condom use self-efficacy partially mediated the relationship between mother-daughter sexual risk communication and the number of days of unprotected sexual intercourse in daughters. Partial mediation indicates that adolescent condom use self-efficacy explained some of the inhibitory effect that parent-adolescent sexual risk communication had on adolescent condom use.

Hutchinson et al. (2003) commented that these findings provided support for mothers' positive influence on daughters' sexual behaviors through sexual risk communication. Findings supported that topic specific discussion was linked to specific reductions in daughters' sexual risk outcomes. Hutchinson et al. noted that the finding of condom use self-efficacy being related only to condom use and not to other sexual risk behaviors, such as number of sexual partner or number of sexual intercourse episodes, might indicate that self-efficacy has a less significant role in some sexual risk behaviors.

In addition, further support was provided for the propositions in social cognitive theory (Bandura, 1977) and theory of planned behavior (Ajzen, 1985, 1991), i.e., self-efficacy is central to behavior.

Kogan et al. (2008) examined the association between role status change, e.g., parenthood, during the transition to adulthood and adolescent sexual risk behaviors in African American adolescents. Kogan et al. found that parenthood was among the factors that positively predicted sexual risk behavior. A protective parenting factor index, consisting of three scales was developed. The three scales were general relationship satisfaction with one's caregiver, frequency of parent-adolescent sexual risk communication, and perceptions of parental norms regarding risk behavior. The protective parenting factor index and religiosity (the importance and influence of religion in adolescents' lives) were tested as moderators of the relationship between adolescents' parental role status and sexual risk behavior. The protective parenting factors were found to buffer the adolescent against further adolescent-parent sexual risk behavior, such as sex without a condom or without birth control, or using alcohol or drugs before sex. The adolescent parents who experienced high levels of protective family processes or high levels of religiosity were found not to be at risk for further sexual risk behavior. High religiosity also moderated the effect of substance use on the adolescent-parents' high-risk sexual behavior.

Kogan et al. (2008) related that family support was critical to the health of late adolescents, particularly African American late adolescents who were parents, who lived alone or with peers, who worked full-time, and who did not have intentions to pursue

additional education. These findings supported the buffering effect of strong family relationships and religious involvement.

Summary of the Review of Findings

This review revealed that parents influenced their late adolescents' sexual risk behavior by previous communication about sexual risk. Yet, the beginnings of research reviewed here have indicated several areas for further discovery about the relationship between parent-adolescent sexual risk communication and late adolescents' sexual risk behaviors. These areas include fathers' roles in sexual socialization, cultural and ethnic differences in parental sexual risk communication, depth of parent-adolescent sexual risk communication including quality, timing of specific parent-adolescent sexual risk communication across adolescence, and the relationship of parent-adolescent sexual risk communication to other forms of parental communication or support.

Review of Limitations of the Methods

Limitations of the methods included issues related to design, conceptual framework, sample, and measurement. The design, conceptual framework and sample information of the nine studies (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000) reviewed are contained in Table 2 of Appendix A. The descriptions of the measures of parent-adolescent sex communication and topics assessed are listed in Table 3 and 4 of Appendix A,

respectively. The description of the measures of adolescent sexual risk behavior and topics assessed are contained in Tables 5 and 6 of Appendix A, respectively.

Design

Only one study (Hutchinson et al., 2003) was based on a quasi-experimental design (see Table 2, Appendix A). The majority of the research was non-experimental, which did not permit causal inferences.

Conceptual Frameworks

Although a majority of the parent-adolescent sexual risk communication researchers used a theoretical or conceptual framework based on cognitive or ecological theories (see Table 2, Appendix A), a clear conceptual definition of parent-adolescent sexual risk communication was not offered. No communication or motivational theories were used to form a conceptual definition of parent-adolescent sexual risk communication or adolescents' sexual risk behavior. However, two research studies (Hutchinson & Montgomery, 2007; Kogan et al., 2008) were based on a theoretical or conceptual framework that incorporated parents' influence on their adolescents' sexual risk behaviors. Hutchinson and Montgomery (2007) used a parent-based expansion of the theory of planned behavior (Ajzen, 1985, 1991) and proposed that parenting processes are external influences of adolescents' beliefs about sexual behaviors. Parents are able through their influence on adolescents' beliefs about sexual behaviors to influence the adolescents' intentions and subsequently the adolescent's sexual risk or safer sex behaviors. As hypothesized, greater amounts of parent-adolescent sexual risk

communication were associated with adolescents' sexual risk-related attitudes, beliefs, and intentions.

Developmental theories were used by Kogan et al. (2008) to explain a transition period during which adolescent risky behaviors were more prevalent, the period of the emerging adulthood (between the ages of 18 to 25 years). Kogan et al., used the theories of emerging adulthood (Arnett, 2000), social developmental (Catalano & Hawkins, 1996), and life-course development (Rutter, 1985) to build a conceptual model that examined the impact of role status change on high-risk sexual behavior with mediating processes of substance abuse and affiliations with risk-promoting peers. Family processes, including parent-adolescent sexual risk communication, and religiosity were examined as moderators. High family processes and high religiosity buffered the negative influence of parenthood on adolescent risky sexual behavior.

Sample

Adequacy of sample size was not documented in the studies reviewed. However, two studies (Hutchinson & Montgomery, 2007; Lehr et al., 2000) had in excess of 400 participants and one (Clawson & Reese-Weber, 2003) had a sample in excess of 200 participants (see Table 2, Appendix A). Three of the five random samples were large with over 1,300 participants in one study (DiIorio, Dudley et al., 2000) and over 200 participants in the remaining two studies (Hutchinson, 2002; Hutchinson et al., 2003). Large samples supported the use of advanced statistical testing and with representativeness of the population. Although there was no explicit discussion of power

in the studies reviewed, the studies had sufficient power to detect significant findings (Field, 2005b).

The use of convenience samples instead of randomly selected samples limited generalization of findings. Studies' designs have relied on university or college students as sources of information about the late adolescent population. This limits what is known about late adolescents. There are many late adolescents that do not attend college. Based on 2006 school enrollment statistics (Davis & Bauman, 2008), 58% of high school students enrolled in four-year or two-year colleges either part-time or full-time. The 42% of high school students who did not enroll in four-year or two-year colleges combined with an 11% high school dropout rate for that same period indicated that a significant portion of adolescents were not represented when samples included only college or university students. In addition, the reliance on students as sources of information about sensitive data, including sexual behavior and substance use has been previously cited as a methodological limitation due to issues of social desirability (Weideman, 2002).

A comprehensive survey of sexual risk behavior requires adequate representation of males in the sample. The samples of four studies (Bynum, 2007; Hutchinson, 1999, 2002; Hutchinson et al., 2003) were 100% females. One study (Hutchinson, 2007) included less than 10% males, and, in three other studies (DiIorio, Dudley et al., 2000; Hutchinson & Montgomery, 2007; Lehr et al., 2000), males represented less than 40% of the sample. The ability to generalize from these samples to the male late adolescent population was limited. The 18- to 24-year-old male comprised 51% of the general population based on statistics from the 2000 U.S. census (US, 2000a). While this fluctuated from sample to sample, any male underrepresentation was a significant

limitation because males were at higher risk for HIV/AIDS in the adolescent population. In 2007, males accounted for 74% of all HIV/AIDS cases diagnosed among the adolescent and adult population (CDC, 2009a).

Measures

The measures of parent-adolescent sexual risk communication and the measures of adolescent sexual risk behavior were diverse. There was a lack of congruence between the particular risk assessed by parent-adolescent sexual risk communication measures and the specific risk addressed by the outcome measures.

Measures of parent-adolescent sexual risk communication. Parent-adolescent sexual risk communication was operationalized in different ways (see Tables 3 and 4, Appendix A, respectively) which made it difficult to synthesize findings across the studies. Measures of parent-adolescent sexual risk communication varied in the number and type of communication topics assessed, the scope of items, response format, and whose perspective was assessed. Some sexual risk communication measures included general communication about sexual development, such as biological or physical development (Bynum, 2007; Clawson & Reese-Weber, 2003). The combination of both sexual risk topics (e.g., birth control) and sexual development topics (e.g., menstruation) as indicators of sexual risk behavior made it difficult to distinguish the unique impact on adolescents' sexual risk behavior by parent-adolescent sexual risk communication and raised questions about the content validity of these measures.

The use of dichotomized response choices in measures of sexual risk

communication limited assessment of frequency or quantity of the sex communication (DiIorio, Dudley et al., 2000; Hutchinson, 1999). In contrast, the Likert scales used in seven studies (Clawson & Reese-Weber, 2003; Hutchinson, 1999, 2002, 2007; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000) enhanced the quantification of parent-adolescent sexual risk communication.

Parents were assessed separately in all but three studies (DiIorio, Dudley et al., 2000; Hutchinson, 1999; Kogan et al., 2008). In these three studies parents' sexual risk communication was assessed together, therefore no individual assessment of mother-adolescent or father-adolescent sexual risk communication was available to permit synthesis of these findings across the studies.

All but one measure of parent-adolescent sexual risk communication assessed communication (Bynum, 2007) from the adolescents' perspective. Assessment of only the adolescents' perspectives of parent-adolescent sexual risk communication has been previously cited as a methodological limitation due to differences in those perceptions. However, some researchers feel that the focus on adolescents' perspectives offer the best explanation of the parents' sexual risk communication, since the adolescents' perceptions are more closely associated with adolescents' own sexual behavior outcomes (Jaccard, Dodge, Dittus, Feldman, & Rosenthal, 2002).

Measures of sexual risk behavior. Adolescents' sexual risk behaviors were also operationalized in different ways (see Tables 5 and 6 of Appendix A, respectively). This variety made it difficult to synthesize findings across the studies. Measures of adolescent sexual risk behavior varied in the number and type of risk behaviors assessed, the scope

of items, response format, and participants who were approached to complete the measures. Only two studies used measures which had established psychometric properties (DiIorio, Dudley et al., 2000; Kogan et al., 2008).

Although all sexual behavior outcomes assessed encompassed an element of what CDC (2009, 2008c) labeled as sexual risk behaviors, some of the outcomes assessed might not be indicative of actual sexual risk. For example, all occurrences of sexual intercourse according to the CDC criteria are considered risky sexual behavior for adolescents whether or not the activity involves protection against pregnancy and transmission of disease (Bynum, 2007; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007). In one study (Bynum, 2007), daughters' sexual experience was the only sexual behavior variable assessed. Sexual experiences measured on an ordinal scale indicated the sexual experience level a daughter had reached with the higher the number representing progressively more intimate sexual behavior. However, sexual experience level may not equate to sexual risk if the sexual experiences were protected against pregnancy and/or STDs. In another study (Hutchinson et al., 2003), numbers of episodes of sexual intercourse were also assessed along with measurements of the number of sexual partners and episodes of unprotected intercourse. Assessment included one possible risky sexual behavior, sexual intercourse, along with two risky sexual behaviors (having multiple sexual partners and engaging in unprotected sex). In these studies, sexual risk behavior might be over- or understated.

Parenthood, which is not the actual risk behavior but a more distal outcome of the sexual risk behavior of unprotected intercourse was considered as a risky sexual state (Kogan et al., 2008). In addition, HIV testing was considered an action indicative of

sexual risk (Clawson & Reese-Weber, 2003; Hutchinson, 1999). However, HIV testing could be a safe sex practice. For example, if the motivation HIV testing for a couple were to ensure an infection free status prior to sex versus an individual testing to determine the possibility of infection from an unsafe sexual experience.

Summary of the Review of Limitations of the Methods

The limitations in the nine studies (Bynum, 2007; Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Hutchinson, 1999, 2002; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007; Kogan et al., 2008; Lehr et al., 2000) reviewed included lack of conceptual based definitions of parent-adolescent sexual risk communication, and adolescent sexual risk behavior, lack of experimental studies, and limited generalizability. A single framework of parent-adolescent sex communication or parent-adolescent sexual risk communication did not emerge in this review. Communication and motivational theories were not used to guide these studies although such theories may inform more specifically how parents influence adolescent behavior choices and provide a triangulation of theoretical frameworks that would strengthen meaning of the findings. The lack of common concepts and definitions made it difficult to integrate findings across studies and conclusions based on this integration may be false.

Autonomy Support from Parents

Autonomy as it relates to late adolescence has been largely conceptualized as independence and separation from parents (Hill & Holmbeck, 1986). Other researchers

(Grotevant & Cooper, 1986; Ryan & Lynch, 1989) have viewed autonomy and independence from parents as integral and related concepts. One approach that overcame the differences between autonomy and independence from parents was self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995). In self-determination theory, autonomy or being self-determined is related to independence and well-being (Chirkov, Ryan, Kim, & Kaplan, 2003; Ryan, 1992), yet is not the same as independence. According to self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995), individuals choose their actions according to their values and beliefs; controlling parental behaviors will inhibit self-determination (Grolnick et al., 1997). In contrast, parents who provide autonomy support by promoting adolescent choice rather than attempting to control adolescent behavior can facilitate adolescents' self-determination (Deci & Ryan, 1987).

Search Strategy

Keywords used in the search for literature about the relationship between parental autonomy support and adolescent sexual risk behavior or adolescent sexual risk knowledge were self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) and autonomy support, parent (including MESH terms for parent in Pub Med), adolescent, behavior, health, and risk. Additional searches were conducted with the terms of adolescent sexual risk communication and adolescent sexual risk knowledge to capture research publications about the relationship of parental autonomy support to adolescent sexual risk behavior or adolescent sexual risk knowledge. The criteria for inclusion was amended to encompass middle adolescents who were 15- to 17-years-of-

age, (Elliott & Feldman, 1990). In addition, other adolescents risk behaviors in addition to sexual risk were included since the original search indicated a lack of research on the relationship between parental autonomy support and sexual risk behavior. The problem behavior theory (Jessor & Jessor, 1977) proposed a clustering of health-harming behaviors (e.g., sexual risk taking behaviors and alcohol use, substance use, and/or tobacco use) in adolescents, which supported expansion of the inclusion criteria. The searches yielded 2 studies (Williams et al., 2000; Wong, 2008). No research studies that examined relationships between parental autonomy support and adolescent sexual risk knowledge were located from these searches.

Review of Findings

A description of the purposes and findings from the two studies (Williams et al., 2000; Wong, 2008) reviewed are presented in Table 7 of Appendix A. Researchers in both studies (Williams et al., 2000; Wong, 2008) used self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) as the basis for their research. The influence of parental autonomy support on adolescents' health risk behaviors was examined in both studies by assessing adolescents' perceptions; however, two different versions of the Perceptions of Parents Scale were used. Wong (2008) used the child version (Grolnick et al., 1991) and Williams et al. (2000) used the college-student version (Robbins, 1994).

The two studies (Williams et al., 2000; Wong, 2008) addressed adolescent health-risk behavior in various ways. Williams (2000) examined adolescent health-risk behavior through assessments of cigarette use, chewing tobacco use, alcohol use, marijuana use, and occurrence of sexual intercourse. These variables were grouped together into a Risk

Behavior Index for multivariate analyses. In contrast, Wong (2008) addressed adolescent health-risk behavior through assessments of substance use (frequency of alcohol, cigarettes, chewing tobacco, and marijuana use) and disruptive behavior. Substance abuse and disruptive behavior were included in analysis separately.

In the Williams et al. study (2000), bivariate analyses indicated that parental autonomy support was negatively related to male and female high school students' health-risk behaviors, including frequency of smoking cigarettes during the past 7 days, frequency of using alcohol during the last 30 days, lifetime use of marijuana, and the occurrence of sexual intercourse. In addition, parental autonomy support was negatively, but not significantly, related to the frequency of chewing tobacco in the last 30 days. Multivariate analysis indicated that parental autonomy support predicted additional variance in adolescents' health-risk behaviors beyond the influence of adolescents' relative extrinsic aspirations and grade level. However, adolescents' relative extrinsic aspirations (e.g., wealth, fame, and image) partially mediated the relationship between parental autonomy support and adolescent health-risk behaviors.

Williams et al. (2000) viewed these findings that greater autonomy support was associated with adolescents having stronger intrinsic life values (e.g., personal growth, meaningful relationships, community contributions, and physical fitness) as confirming self-determination theory. In addition, Williams et al., explained that adolescents had stronger intrinsic life values because the autonomous parenting style facilitates adolescents' experiences of satisfaction of their basic psychological needs. Furthermore, Williams et al., noted that the relationship between adolescents' stronger extrinsic aspirations and engagement in more health-risk behaviors made adolescents more

vulnerable to tobacco and alcohol media, peer pressures to use illegal substances, and engagement in early sexual initiation.

Wong (2008) studied male and female middle and high school students to test the relationship of parental involvement and parental autonomy support with academic performance, classroom disruptive behavior, and substance use (frequency of alcohol use, cigarette use, chewing tobacco use, and marijuana use). Bivariate analysis indicated that greater parental autonomy support was associated with less alcohol use and with greater identified regulation. Identified regulation was defined as engagement in a task because it was important and valuable. The investigator found that identified regulation was negatively associated with disruptive behavior and alcohol and cigarette use.

Wong (2008) tested a model of parental involvement, parental autonomy support, effortful control, identified regulation, and disruptive behavior. Wong found that parental autonomy support was positively related to identified regulation, which was negatively related to disruptive behavior. Although, parental autonomy support had no direct relationship to disruptive behavior, parental involvement did have a direct negative relationship with disruptive behavior. Parental autonomy support and parental involvement were significantly correlated with one another. Wong conducted additional analyses and divided students into low-risk and high-risk groups. High-risk students were defined as those students who had least one parent who could not speak English well, and at least one parent who did not have an education past high school. Findings from multiple group analyses indicated the relationships in this model were similar across both groups of students.

Wong (2008) added substance abuse to the model and tested this model of parental involvement, parental autonomy support, effortful control, identified regulation, disruptive behavior, and included substance use. Similar to the previous model, parental autonomy support was positively related to identified regulation, which was negatively related to disruptive behavior. In this model, however, disruptive behavior was positively related to substance use but only in the high-risk students. Parental involvement had a direct negative relationship to the outcome variable, substance use, regardless of risk.

Wong (2008) concluded that autonomy supportive parents facilitate self-determination in their adolescents. In addition, Wong asserted that, when high-risk adolescents perceived autonomy support and parental involvement, identified regulation was an important protective factor.

Review of Limitations of the Methods

Limitations of the methods included issues related to design, conceptual frameworks, sample, measures, and data collection procedures employed. The design, conceptual framework and sample information of the two studies (Williams et al., 2000; Wong, 2008) reviewed are contained in Table 8 of Appendix A.

Design

The sole use of cross-sectional designs in the two studies reviewed (Williams et al., 2000; Wong, 2008) prohibited interpretations of causality.

Conceptual Framework

The two studies (Williams et al., 2000; Wong, 2008) were based on self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995). Williams et al. (2000) found parental autonomy support was negatively related to the adolescent risk behaviors of cigarette use, alcohol use, marijuana use, and occurrence of sexual intercourse, however, partial mediation by the variable adolescents' extrinsic values was accountable for some indirect effects. Wong (2008), found autonomy support was negatively related to disruptive behaviors in the classroom, through the mediation of identified regulation, and disruptive behaviors were negatively related to substance use. Findings from both studies (Williams et al., 2000; Wong, 2008) supported the relationship between parental autonomy support and adolescents' reduced health-risk behaviors and demonstrated significance that supported self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995)

Sample

The use of convenience samples (Williams et al., 2000; Wong, 2008) instead of randomly selected samples limited generalization of findings beyond the samples of middle adolescents tested. The reliance on students as sources of information about sensitive data, including sexual behavior and substance use has been previously cited as a methodological limitation due to issues of social desirability (Weideman, 2002). Although both studies had in excess of 140 participants each, adequacy of sample sizes was not documented in the studies reviewed. Although there was no explicit discussion

of power in the studies reviewed, the studies had sufficient power to detect significant findings (Field, 2005b).

Measures

One measurement issue was the use of the children's Perceptions of Parents Scale (Grolnick et al., 1997) to assess middle adolescents and high school students (Wong, 2008). The college version of the Perceptions of Parents Scale (Robbins, 1994) might have been more appropriate because it was designed for an older adolescent. Questions on the children's version were developed for children as young as 8-years-old and might not have captured the perceptions of a middle or high school adolescent who were on the verge of late adolescence.

Procedures

Williams et al. (2000) and Wong (2008) used the high school environment (classrooms and cafeteria) as places to collect the data. There was no discussion of how privacy was provided when the adolescents completed the surveys. Issues of social desirability could be increased when privacy is not provided (Jaccard, 2004).

Summary

While there is limited research that addresses parental autonomy support related to adolescent sexual risk behaviors and sexual risk knowledge among late adolescents, findings of these two studies (Williams et al., 2000; Wong, 2008) of other risk behaviors

among younger adolescents suggest that greater autonomy support may also be associated with less sexual risk behavior and other risky health behaviors, such as, less alcohol and tobacco use among older adolescents. However, these relationships have not been investigated among older adolescents. Although, the samples in the Williams et al. and Wong studies were middle adolescents, the findings supported the assumptions of self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) and the further examination of parent autonomy support in late adolescents.

Adolescent Autonomous Motivation

Motivation has been a core issue of biological, cognitive, and social regulation in the field of psychology (Ryan & Deci, 2000b). Theories of motivation have focused on psychological needs as acquired. Self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) also focuses on how the basic needs of autonomy, competence, and relatedness are enhanced or thwarted; self-determination theory focuses on human needs as the causes of motivation. Environmental factors that enhance self-determined behavior are of interest in motivational research involving self-determination theory (Ryan & Deci, 2000a). The environmental factors include autonomy support from parents and its facilitation of intrinsic motivation. Several types of motivation are proposed ranging from lack of motivation to motivations based on external values (extrinsic), to those based on internal values (intrinsic). Intrinsic or autonomous motivation is defined as the motivation to freely choose an activity based on an internalization of values (Deci & Ryan, 2008). Autonomous motivation is demonstrated when one performs a behavior because it is personally valued and when one feels

confident in achieving a healthy outcome from the chosen behavior (Ryan & Deci, 2000b).

Autonomous motivation may be best known within the education domain as the subject of assessment of teachers of adolescent perceptions (Ryan & Grolnick, 1986), and as a predictor of adolescent academic motivation and self-esteem (Ryan & Stiller, 1994). Autonomous motivation has been examined in other domains, e.g., work, sports, religion, psychotherapy, and, of interest here, the health care domain (Ryan & Deci, 2000b). During the last decade, health care researchers have focused their research on risky health behaviors in adolescents. Research findings have indicated that autonomy support from parents is positively associated with increased autonomous motivation to decrease risky behavior (Williams et al., 1999; Williams et al., 2000).

Search Strategy

Keywords used in the search for literature about the relationship between adolescent autonomous motivation and adolescent sexual risk behavior or adolescent sexual risk knowledge were self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) and autonomous motivation, parent (including MESH terms for parent in Pub Med), adolescent, behavior, health, and risk. Separate searches were conducted on the terms of adolescent sexual risk communication and adolescent sexual risk knowledge. The latter two searches were completed to capture additional research about the relationship between adolescent autonomous motivation and parental autonomy support or adolescent sexual risk behavior or adolescent sexual risk knowledge. The inclusion criteria was amended to include middle adolescents, i.e., those who were 15- to 17-years-

of-age, (Elliott & Feldman, 1990) due to the lack of research on late adolescents, who were 18- to 20-years-of-age. In addition, the outcomes of adolescent risk behaviors were expanded to include other adolescent risk behaviors in addition to sexual risk, since there was a lack of published studies addressing adolescent sexual risk and autonomous motivation. This strategy was adopted because the problem behavior theory (Jessor & Jessor, 1977) proposes a clustering of health-harming behaviors (e.g., sexual risk taking behaviors and alcohol use, substance use, and/or tobacco use) in adolescents. One article addressing autonomy orientation rather than autonomous motivation was included. Autonomy orientation was defined as one of three characterizations of an individual's behavior (Deci & Ryan, 1985a). Autonomy orientation results in behaviors that are self-determined, in contrast to orientations that are controlled and impersonal. Autonomous motivation is demonstrated when one performs a self-determined behavior (Ryan & Deci, 2000b). Since autonomy orientation appeared to have congruence with the term autonomous motivation, the study was included in this review.

The searches yielded only 2 articles (Neighbors, Walker, & Larimer, 2003; Williams et al., 1999) that met the inclusion criteria. No studies examining the relationships between parental autonomy support and adolescent sexual risk knowledge were located in these searches.

Review of Findings

Purposes and findings from the two studies (Neighbors et al., 2003; Williams et al., 1999) reviewed are presented in Table 9, Appendix A.

As with the construct of autonomy support from parents, the review revealed little research has been conducted on middle or late adolescents' autonomous motivation and adolescents' sexual risk behavior or sexual risk knowledge. The only adolescent health risk behaviors studied and found to be related to autonomous motivation were alcohol use and smoking cigarettes. Neighbors et al. (2003) studied autonomous orientation as a moderator affecting the relationships between male and female college students' 1) alcohol expectancies (the belief that an effect would occur from the influence of alcohol) and alcohol consumption, 2) alcohol expectancies and negative consequences, 3) evaluations of alcohol effects and alcohol consumption, and 4) evaluations of alcohol effects and negative consequences, and tested whether moderation effects would be more obvious among males than females.

Measuring both autonomy and controlled orientations, Neighbors et al. (2003) found that among students who reported less autonomous orientations, the relationship between positive alcohol expectancies and alcohol consumption was stronger. Among male students who reported more controlled orientations, the relationship between positive alcohol expectancies and alcohol consumption was also stronger. The same pattern of findings was exhibited for the relationship between evaluations of alcohol effects and alcohol consumption and the relationship between positive alcohol expectancies and negative consequences, except that females' positive alcohol expectations were related to more negative consequences regardless of the level of controlled orientation.

According to SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) controlled motivation is extrinsically driven rather than self-regulated. The findings of Neighbors et

al. (2003) supported propositions from SDT related to health outcomes; motivations that are less self-determined (more pressured) are associated with poorer health outcomes later in life, such as, excessive alcohol use (Ryan, Plant et al., 1995). In addition, gender moderated the impact of controlled orientations more than autonomous orientations.

Neighbors et al. suggested the controlled orientation findings are more consistent with the stigma attached to excessive drinking for females; when males consume too much alcohol it is viewed as a socialization rite of passage, but when females consume too much alcohol they may be viewed as sexually promiscuous (George, Gournic, & McAfee, 1988). Therefore, for females positives of alcohol consumption are ambiguous. However, the autonomous orientation findings suggest that gender differences in values and choice associated with autonomy were less clearly delineated.

Another study (Williams et al., 1999), tested an intervention (style and message) for not smoking among high school students. Researchers found that, after male and female high school students participated in an autonomy supportive intervention, autonomous motivation for not smoking increased. However, adolescents reported decreased smoking because of perceived autonomy supportiveness of the presenters, not because of the autonomy supportive presentations. The message delivered in the presentations did not have direct effects on the change in adolescents' autonomous motivation or on changes in smoking patterns, perhaps due to low power. Although these findings did not provide support for self-determination theory through the autonomy supportive message delivered, the findings did provide indirect support through autonomy supportive presenters. These findings support positive health outcomes when

adolescents were autonomously motivated by adult figures that were autonomy supportive.

Review of Limitations of the Methods

Limitations of the methods included issues related to design, conceptual frameworks, sample and data collection procedures employed. The design, conceptual framework and sample information of the two studies (Neighbors et al., 2003; Williams et al., 1999) reviewed are contained in Table 10, Appendix A.

Design

The design used by Neighbors et al. (2003) was correlational while the design used by Williams et al. (1999) used quasi-experimental. The sole use of cross-sectional designs in the two studies reviewed (Neighbors et al., 2003; Williams et al., 1999) precluded causal interpretations.

Conceptual Frameworks

Both studies (Neighbors et al., 2003; Williams et al., 1999) were based on self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) Neighbors et al. (2003) examined autonomous motivation for its moderation of the relationship between alcohol expectations and college students' alcohol consumption, negative consequences from alcohol use, and alcohol-related problems. Williams et al. (1999) examined the influence of autonomous motivation on the reduction of smoking in high school students. Findings from both studies (Neighbors et al., 2003; Williams et al., 1999) supported the

relationship between adolescents' autonomous motivation and two adolescent health-risk behaviors (alcohol use and smoking cigarettes) which provided encouragement to examine another health-risk behavior of late adolescents, sexual risk behavior.

Sample

Investigators of both studies (Neighbors et al., 2003; Williams et al., 1999) used convenience samples which limited generalization of findings beyond those adolescents who were similar to the samples of adolescents tested. The reliance on students as sources of information about sensitive data, including substance use and cigarette use, has been previously cited as a methodological limitation due to issues of social desirability (Weideman, 2002). Adequacy of sample sizes was not documented in the reports of these studies. However, the two studies reported by Williams et al., had an excess of 150 participants each, and the Neighbors et al. study had a sample that exceeded 500 participants. Although there was no explicit discussion of power in the studies reviewed, the studies had sufficient power to detect significant findings (Field, 2005b).

Procedures

Williams et al. (1999) and Neighbors et al. (2003) used the school environment (classrooms) as places to collect the data. There was no discussion of how privacy was provided to the adolescents during completion of the surveys. Issues of social desirability could have been increased if privacy was not provided (Jaccard, 2004).

Summary

While there is limited research on adolescent autonomous motivation related to adolescent sexual risk behaviors and sexual risk knowledge among adolescents, findings suggest that greater adolescent autonomous motivation is associated with less risky health behaviors, such as less use of alcohol and cigarettes (Neighbors et al., 2003; Williams et al., 1999). Although, the samples in the Neighbors et al. and Williams et al. studies included college students and high school students, and did not solely address late adolescents, the Neighbors et al. and the Williams et al. findings supported the assumptions of SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) and the need for further examination of adolescent autonomous motivation and adolescent health-risk behaviors in late adolescents.

Adolescent Sexual Risk Knowledge

Adolescent sexual risk knowledge is discussed in this section because the search strategy that included the variables of parent-adolescent sexual risk communication, autonomy support from parents, and adolescent autonomous motivation, did not yield articles about adolescent sexual risk knowledge. Terms used in the search for sexual risk knowledge were sexual risk knowledge, adolescent sexual risk knowledge and adolescent sexual knowledge.

Sexual risk knowledge has been assessed in 3 studies (Ancheta, Hynes, & Shrier, 2005; Shrier et al., 2001; Shrier, Goodman, & Emans, 1999) of female late adolescents who had sexually transmitted diseases. The findings from these three studies consistently indicated that adolescent sexual risk knowledge was associated with a decrease in risky

sexual behavior. Findings from a randomized controlled trial (Shrier et al., 2001) supported the importance of formal instruction on sexual health education with frequent booster sessions to reduce adolescent sexual risk behavior in high-risk adolescents.

Summary

Limited research has examined parents' influence on adolescent sexual behavior during late adolescence; one key area previously examined is that of parent-adolescent sexual risk communication. Another key area of parental influence may be parental autonomy support. However, research examining autonomy support from parents and sexual health of the late adolescence was not found. Furthermore, the relationship of these parental influences on adolescent motivation has not been examined in late adolescents. Although findings from studies based on self-determination theory suggest that parental autonomy support and adolescent autonomous motivation are associated with healthier behaviors, self-determination theory has not been used to examine parental influences on adolescent sexual risk behavior. Research addressing these gaps using self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) should produce findings about adolescents' sexual risk behavior and adolescents' sexual risk knowledge. Furthermore, the majority of studies in this review were correlational and cross-sectional designs, employed convenience samples, and lacked well-developed conceptual frameworks and well-developed valid measures of sexual risk behavior. Specifically, there was a lack of conceptual definitions for the terms parent-adolescent sexual risk communication and adolescent sexual risk behavior. This resulted in questions about the validity of measures and created difficulty integrating findings across studies.

CHAPTER 3 METHODOLOGY

The aims of the study were to assess a model of parent-adolescent sexual risk communication and parental autonomy support as influences on adolescent autonomy, motivation, sexual risk knowledge, and sexual risk behavior of late adolescents. The proposed model was derived from self-determination theory and a review of literature. The following aspects of the research methodology are addressed in this chapter: design, sampling procedure, data collection procedures, instruments and instrumentation, pilot, and data analysis plan.

Design

A quantitative, cross-sectional, descriptive, correlational, design was used to examine the relationships among four independent variables (mother-adolescent and father-adolescent sexual risk communication and mother and father autonomy support), two dependent or outcome variables (adolescent sexual risk knowledge and adolescent sexual risk behavior), and a mediator (adolescent autonomous motivation). There were significant challenges anticipated in this study's design, including recruiting students in a narrower age range (i.e., 19- and 20- year-olds). Recruitment of a broader age range (i.e., 18- to 21-year-olds) would have taken less time as there were ample opportunities to assess the broader age range.

Description of the Sampling Procedure

A convenience sample of late adolescents was recruited for participation in this research study. A sample size from 155 to 620 was determined based on two criteria.

The first (Tabachnick & Fidell, 2001) recommended a sample size from 200 to 400 with 10 to 15 parameters; 10 to 20 cases per parameters. Bollen's Rule (Bollen, 1989) indicated that 5 to 10 cases are required for each parameter. This study was based on 31 parameters. Therefore, according to Bollen's Rule, the range for the number of participants enrolled in the study was estimated to be from 155 to 310. Therefore recruitment of at least 310 participants was planned to ensure adherence with both guidelines and to allow for rejected surveys (i.e., both parents not living).

Steps were taken to achieve as representative a sample as possible including the recruitment of participants from a large, public, educational institution, recruitment of males and females from ethnically diverse populations, and recruitment of a representative number of males. Eligibility criteria for participation in the study were that the adolescent: (a) must be either 19- or 20-years-old, (b) must speak and read English, (c) must be unmarried, (d) must not be a parent, and (e) must be enrolled at the institution during the academic year where the data was collected. Since the instrument measuring parent-adolescent sexual risk communication (Hutchinson, 2007) used in this study requested recall of sexual risk communication during the period of 10-years-of-age to 18-years-of-age, adolescent age was restricted to 19- to 20-years-of-age to reduce recall variability (questions that ask about sexual risk communication prior to age 18 years). Those individuals who did not speak or read English were excluded because no interpreters were available. Those individuals who were spouses were excluded because a spouse could influence the responses of the participant; upon marriage, a spouse often becomes the primary influence in health behaviors instead of a parent (Homish & Leonard, 2008). Those participants who were parents were excluded because they were

developmentally different from those 19- to 20-year-olds who were not parents. This difference might include the influence of parenthood on health risk taking behaviors (Cameron, DeShazo, & Johnson, 2010).

The convenience sample of adolescents were recruited from places on campus that 19- to 20-year-old college students were likely to gather, e.g., library, common area outside the cafeteria or bookstore, and a recreation area. Participants responded to personal approaches, advertisements, or announcements at a senior college in a major metropolitan area of the state of Alabama.

Participants were recruited by advertisement via a flyer (Appendix B) handed out by the principal investigator. Personal approaches included the principal investigator handing out flyers to students by intercept, which involved handing out flyers to individuals as they passed by.

The participants were given an incentive upon completion of the questionnaires. Due to the anonymous participation in this survey and the sensitive nature of the survey content, incentives were awarded in the form of \$5 food gift card from a commercial dining establishment, that was in close proximity to the institutions. Partial funding of this study was received from Sigma Theta Tau International, Nu Chapter in the amount of \$750; the principal investigator paid all other costs.

Protection of Human Subjects

Institutional review board (IRB) approvals (see Appendices C - 1 and C - 2) as well as site-specific agencies' support letters (see Appendix D) were obtained prior to initiation of any data collection of the pilot study and/or primary study. Prior to receipt

of the questionnaire, the participant was made aware of the study via a cover letter that conveyed, 1) the purpose of the study, 2) the voluntary nature of their participation, 3) the anonymity and confidentiality of their responses, and 4) that completion of the questionnaire would have no influence on their student status or grades and that they would receive no special treatment for participating. Participants were reminded of the inclusion criteria as well. In addition, participants were informed that there were minimal risks to them. Participants were told that, if they experienced discomfort about answering any questions at any time, they could cease their participation in the study without penalty. Participants who experienced distress or who had questions about contraceptive, STD or HIV/AIDS testing or treatment or other sexual health matters were referred to their primary health care provider. All of the foregoing items were contained in an IRB approved document, the cover letter for the questionnaire, where informed consent was discussed with the participant. Informed consent was discussed with the participant in a private area of the collection site. Documentation of informed consent through participant signature was waived per approval by the IRB. This waiver protected the identity of the participant while at the same time it provided the participants' conveyance of consent. There were no students who experienced distress or had questions about STD testing or treatment.

Recruitment and Data Collection Procedures

Data collection occurred during the 2010 spring, summer, and fall terms. The primary investigator collected the data. Because of the sensitive nature of the data collected (reporting sexual risk communication, sexual risk behavior, and sexual risk

knowledge) anonymous surveys were administered to reduce the influence of socially desirability and to foster honest and confidential responses (Waltz, Strickland, & Lenz, 2005). To maximize truthful responses and minimize social desirability responses, participants were asked to respond truthfully, were ensured of the anonymous nature and confidentiality of their responses, were directed to a contiguous private sitting area to complete the survey, and provided responses on self-report measures. In some cases, participants took the survey with them to complete while eating lunch or during breaks. In addition, wording of the recruitment flyer, cover letter to the questionnaire, and introductions to questions on the questionnaire were composed to reassure the participant that their answers would not be interpreted in a negative manner (Fowler & Cosenza, 2008; Jaccard, 2004; Waltz et al., 2005). Participants were asked to not place their names or any identifying marks on the questionnaire. Consequently, it is possible that an individual participated more than once and their duplicate responses were not identified. This was minimized by the principal investigator's presence and oversight of all data collection, and by collection of data at three different sites on different days and times. However, with a large sample size of at least 155, it is unlikely the principal investigator was able to identify all participants who might have attempted to complete the survey more than once for the incentive derived.

Several data collection strategies were employed (as described earlier). When greeting participants and soliciting their participation, a flyer (see Appendix B) was used to convey the basic information about the principal investigator and survey. First, the investigator introduced herself and the potential participant was handed the flyer (see Appendix B) to read over in private. The flyer (see Appendix B) included the description

of the survey as seeking to examine the parental influences on their sons' and daughters' autonomous motivation, sexual risk knowledge and behavior. Flyer (see Appendix B) information also outlined the inclusion criteria for the study, provided an estimated time for completion, requested their voluntary participation in the study, emphasized the confidentiality of their responses, informed them of an incentive, and contained the principal investigator's contact information.

After the participant read the flyer and approached the principal investigator indicating interest in participation, a cover letter (see Appendix E), questionnaire packet (see Appendix F), and envelope was presented to the individual on a clipboard with a pen. The participant was directed to a contiguous place where the participant could sit in privacy to read the cover letter, and if desired, complete the questionnaire packet. The participant was instructed to keep the cover letter or return it for recycling. The cover letter included information about the principal investigator including contact information, the study purpose, the voluntary and confidential nature of the study, a statement to encourage the participant to answer all questions truthfully, and instructions to ask the principal investigator for help if there were problems completing the survey. The cover letter also addressed the participant's right to withdraw (stop) from the study at any time and that, stopping participation would not affect their class standing or grades. In addition, individuals were informed that they would not receive any special consideration if they participated in this research. Furthermore, the cover letter provided information about conveyance of consent, and the incentive to be given. The questionnaire packet consisted of a series of seven questionnaires stapled together and all instructions necessary to complete the document were included.

If the individual could not complete the survey at the initial approach from the principal investigator, they were asked to view the times posted on the collection box for other opportunities to participate. In addition, the student was informed that there were other days available on campus and told of the locations for opportunities to complete the questionnaire. Collection times posted were in increments from two to four hours.

The collection box was available adjacent to the principal investigator for the participants to place the envelope with the completed questionnaire inside. The collection box had a slot to put the envelope containing the questionnaire in, in order to promote the participant's confidence that surveys would not be left lying about and to promote the sense of anonymity and privacy of responses. Upon deposit of the envelope containing the completed questionnaire, the participant was thanked for his/her time and effort in completing the questionnaire, and was given a \$5 gift card.

Data Safety & Integrity

All data was de-identified by default due to the anonymity of responses. Data was stored and recorded on a secured password protected personal computer. Data was checked for integrity of answers.

Review of the Instruments

The questionnaire (see Appendix F) contained seven measures including the investigator developed demographic questionnaire. The order of the surveys was purposely arranged so that participants completed the measures with the least sensitive items first and measures with the most sensitive items last. The instruments were

selected based on their intended purpose, their relationship to the conceptual model for this research, their appropriateness for the age of the sample, and their psychometric properties. Permission to use the instruments was obtained from the authors.

Demographic Questionnaire

The Demographic Questionnaire (DQ) was designed by the investigator to measure variables of gender, age, race/ethnicity, current living arrangements, and current enrollment in the institution where the data was collected. In addition, the participant was asked to provide their mother's age, father's age, whether his/her mother or father were living or deceased, mother's education, father's education, mother's occupation, father's occupation, and biological parents' marital status.

A family social status was planned to be derived from the four factors of parents' gender, education, occupation, and marital status (referred to in questionnaire as cohabitation status), using the measure entitled Four Factor Index of Social Status (Hollingshead, 1965). The results of the Four Factor Index of Social Status (Hollingshead Index) would have been used to describe the sample. The choice of demographic variables was based on variables that would best describe the sample. However, data on parents' occupation was incomplete and precluded further analysis of family social status.

Parent-adolescent Sexual Risk Communication

Purpose and Description

The Parent-Teen Sexual Risk Communication Scale-III (PTSRC-III) was an adolescent report that measured the amount of sexual risk communication the male or female late adolescent received from their mother-figure and father-figure over the teen years of 10- to 18-years-of-age (Hutchinson, 2007). The PTSRC- III is a sub-scale of 8-items contained in a larger scale of 15-items that measured parent-adolescent sex communication. These same 15-items were repeated for mother and father. Only the 8-items constituting the PTSRC-III were used in the data analysis of this study since the PTSRC-III focused on sexual risks and negative outcomes. Other questions on the scale addressed sex communication, alcohol and drug use and the influence on sexual risk, the closeness to parents, and the ease of remembering sexual communication from parents. Adolescents self-reported the quantity of sexual risk communication from mothers and fathers, separately (choice of alternative parent figures is allowed).

The instrument was originally developed between 1992 and 1994 as part of Hutchinson's dissertation study (Hutchinson, 1994). The original 3-item scale was developed because there was no existing comprehensive measure of parent-adolescent sexual risk communication (Fisher, 1993). Refinements were made to the instrument by reviewing other related instruments, gathering input from adolescents, family therapists, interventionists, sex educators, and nurses. The PTSRC-III scale in its original form was first used in a 1998 study (Hutchinson & Cooney, 1998).

The current 8-item PTSRC-III scale (Hutchinson, 2007) assessed two samples of late adolescents, i.e., college freshmen aged 18- to 25-years-old ($N = 95$) and female

licensed drivers aged 19- to 21-years-old ($N = 234$). Both samples' participants provided retrospective self-reports of information given by their parents to them about specified sexual risk topics. The sexual risk topics were related to birth control, STDs, HIV/AIDS, condoms, how youth can protect themselves from acquiring HIV/AIDS, postponing or not having sex, peer pressure to have sex, and how youth can handle sexual pressure. The response format of the scale items was from one to five, which respectively represented "none", "a little", "some", "a lot", or "extensive" amounts of communication. Total scores for the sexual risk sub-scale ranged from 8 to 40 for each parent, where the higher score indicated higher quantities of sexual risk communication.

Conceptualization of the Scale

No explicit conceptual framework was identified in a report of the scale's development (Hutchinson, 2007), but references by the author to the idea that adolescent sexual activity occurs within a broader ecological context implied an ecological framework (Bronfenbrenner, 1989). The author identified individual, dyad, and family variables that influenced young women's perceptions of risk for STDs (Hutchinson, 1999). Hutchinson later used the parent-based expansion of the theory of planned behavior (Ajzen, 1985, 1991; Hutchinson & Wood, 2007) to address how parents influence adolescents' sexual risk-related attitudes and behaviors in a study of 488 African American college students (Hutchinson & Montgomery, 2007). Hutchinson (2007) stated that a future or pending revision would include a third sub-scale addressing parent-adolescent communication about sexual morality and values of adolescent sexual risk behaviors.

Psychometric Properties

Test-retest reliability was performed on the PTSRC-III (Hutchinson, 2007) over two months. The two-month period was selected to assess the stability of retrospective reports of parent-teen sexual risk communication while also minimizing memory effects. Correlations of .88 were obtained for adolescent report regarding mother-adolescent sexual risk communication and .79 was obtained for adolescents' reports of father-adolescent sexual risk communication. Evidence for high internal consistency was found in testing of the measure among 18- to 21-year-old adolescents. Cronbach's alpha for adolescents' reports of mother-adolescent sexual risk communication ranged from .93 to .94 across 2 studies, and the Cronbach's alpha for adolescents' reports of father-adolescent sexual risk communication ranged from .88 to .94 (Hutchinson, 2002, 2007).

Content and construct validity of the PTSRC-III has been assessed (Hutchinson, 2007). Content validity of the PTSRC-III scale was established using a panel of eight experts (one nurse midwife, two doctoral prepared nurse researchers, two family researchers, two sex educators, and one demographer) who rated the 10-point scale as representative and comprehensive on all items.

Construct validity for the PTSRC-III (Hutchinson, 2007) was assessed by examining convergent validity, the relationship (Pearson's r) between PTSRC-III scores and three closely related constructs (global PCSC, parent-child closeness, and perceived parental comfort with sexual communication). These constructs were assessed with widely used and published single item measures. The scores on the PTSRC-III with each parent were highly correlated with these constructs across two studies (Hutchinson, 2002, 2007). In addition, principal axis factoring with oblique rotation was performed on the

items and revealed two factors with eigenvalues greater than 1.0, i.e., communication associated with management or reduction of risk for undesirable sexual outcomes and communication associated with prevention of sexual risk through sexual abstinence. This analysis was confirmed with principal components factor analysis with findings similar to those obtained in the principal axis factoring.

Limitations of the Measure

Only three studies (Hutchinson, 2002, 2007; Hutchinson & Montgomery, 2007) published to date had examined the properties of the PTSRC-III; two of these studies assessed samples that were predominately female (Hutchinson, 2002, 2007). Another limitation of the measure was that recall about the last decade of parent-adolescent sexual risk communication might not be accurate. Current experiences might have altered perceptions of past events. Therefore, there might have been a distortion effect on the frequency of sexual risk communication reported (Lefkowitz, 2002). This measure was subjected to psychometric testing by the author/investigator in a pilot study with a sample of male and female late adolescent college students selected from the general population of college students that included only 10% males, and a sample of female licensed drivers, both of which may not have represented the general population.

Parental Support of Adolescent Autonomy

Purpose and Description

The Perceptions of Parents Scales (Grolnick et al., 1991) were designed to measure the extent to which parents provided, according to SDT (Deci & Ryan, 1985b;

Ryan, Deci et al., 1995), an optimal parenting milieu (Grolnick et al., 1997). The college-student version of the Perceptions of Parents Scales (POPS) was intended for use with older adolescents (Grolnick et al., 1991). The POPS was used to assess adolescents' perceptions of each parent's autonomy support, involvement, and warmth. In this study, only scores from one sub-scale of the college-student version were used in the data analysis, i.e., the scale that measured each parent's autonomy support. The autonomy support items (9 items) were used to assess parents' autonomy support (questions duplicated for mother and father). This instrument was taken from the SDT website located on the web at (http://www.psych.rochester.edu/SDT/measures/pops_collegestudentscale.php).

The initial 42-item college-student version of the POPS was developed as part of a doctoral dissertation (Robbins, 1994). The autonomy support sub-scale score was calculated on nine duplicate items that addressed the mother's and the father's autonomy support; the other items addressed mothers' and fathers' controlling support. Based on a 7-point Likert response format, the questions addressed thoughts about one's parents and answers ranged from "not at all true" to "very true". Composite scores for each parent were averaged after correcting for reverse scored items. A substitution of alternate parent figures was allowed. The higher the score, the greater the parental autonomy support. The score range for the parent's autonomy support sub-scale was from 9 to 63 points for adolescents' perceptions of mother and father, separately.

Conceptualization of the Scale

Within SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995), it had been assumed

that motivation was innate; a child would naturally take in social values and behaviors and made them his/her own. Parents as socialization agents of sexual values and behavior either impeded or facilitated the natural internalization of those values and behaviors (Grolnick et al., 1997). Different values had different effects on health outcomes. Intrinsic valuing or motivation, rather than extrinsic motivation, was associated with healthier outcomes (Ryan & Deci, 2000a). Intrinsic motivation was defined as performing a behavior or activity because it was naturally satisfactory, rather than being motivated by consequence; this was the model of autonomy proposed by SDT theorists. Extrinsic motivation was defined as performing a behavior or activity because it results in attainment of external outcomes, not for the satisfaction derived from the activity itself, but from an outside influence, such as seeking a reward for an action (Ryan & Deci, 2000b). Since autonomy support supports intrinsic motivation (Ryan et al., 2006), it was a central dimension of parenting that promotes healthy or autonomous motivation in adolescents (Grolnick et al., 1997).

Psychometric Properties

Robbins (1994) provided preliminary evidence for the reliability and validity of the autonomy support sub-scale from his unpublished dissertation study. In an examination of male and female college students and his/her parents, internal consistency of Robbins' measure was supported with a Cronbach's alpha of .79 for adolescents' perceptions of their mothers' autonomy support, and a Cronbach's alpha of .77 for their fathers' autonomy support. Robbins (1994) established construct validity, using convergent validity, and found that parental autonomy support was related to adolescent

outcomes. Specifically, the adolescent outcomes were self-esteem, self-regulation, mental health, and causality orientations (the way an individual regulates his/her behavior) (Deci & Ryan, 1985a). In addition, findings revealed that more perceived parental autonomy support was related to more vitality and self-actualization, while less perceived parental autonomy support was related to more difficulty with separation-individuation. Student perceptions of paternal autonomy support were positively correlated with fathers' reports of self-esteem and mental health, and student perceptions of mothers' autonomy support were positively correlated with the level of autonomous causality orientation in mothers. The dissertation work was performed under the supervision of Richard M. Ryan, one of the co-founders of SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995).

The college-student version of the POPS has been refined over time. A 10-item version of the autonomy support sub-scale was used in a study of 271 male and female high school students and yielded a Cronbach's alpha of .91 for perceptions of parents' autonomy support, collectively (Williams et al., 2000). Perceptions of parental autonomy support predicted less adolescent health-risk behaviors ($\beta = -.19, p < .01$). Researchers (Chirkov & Ryan, 2001) used an 8-item version of the autonomy support sub-scale of the college version POPS to measure mother's and father's autonomy support, and to assess its reliability with 16- to 19-year-old male and female high school students. Findings included a Cronbach's alpha of .85 for perceptions of parents' autonomy support, collectively. Predictive validity was supported; perceived parental autonomy support predicted greater academic self-motivation and psychological well-being. In addition, researchers (Niemic et al., 2006) used a 7-item version of the autonomy support sub-

scale of the college version POPS with male and female high school students ($N = 231$), to measure mother's and father's autonomy support, and to assess reliability. Findings included a Cronbach's alpha of .88 for both the mother and father sub-scales, separately. Further, predictive validity was evidenced in this research when support from both mothers and fathers was found to predict the adolescents' psychological well-being.

Limitations of the Measure

There has been limited use of the nine item autonomy support sub-scale of the college version of the POPS (Robbins, 1994) for assessing autonomy support by parents with late adolescents over 18-years-of-age. This version had been adapted in several studies with high school students (Chirkov & Ryan, 2001; Niemiec et al., 2006; Williams et al., 2000). The original measure was subjected to psychometric testing in a pilot study with a sample of male and female late adolescent college students selected from the general population of college students, limiting its use with other populations of adolescents. Prior to initiating the present study, this measure was subjected to psychometric testing in a pilot study with a sample of male and female late adolescent college students selected from the general population of college students.

Adolescents' Autonomous Motivation

Purpose and Description

Adolescent autonomous motivation was assessed by an adaptation of the Treatment of Self-Regulation Questionnaire (Ryan & Connell, 1989; Williams et al., 1996). The Treatment Self-Regulation Questionnaire (TSRQ) is a questionnaire used to

assess reasons someone engages in or changes certain health behaviors. The development of the TSRQ was based on an approach to self-regulation that was embedded in SDT (Ryan & Connell, 1989). The TSRQ was first used to assess healthy behavior in a study about weight loss and weight-loss maintenance (Williams et al., 1996). The questionnaire was then adapted to address several other risky behaviors, including smoking cessation (Williams et al., 1999) and alcohol addiction treatment (Ryan, Plant et al., 1995). For the purposes of this study, the TSRQ was modified to address sexual risk behavior following the guidelines developed by SDT theorist and researchers, one of whom was an author of the TSRQ (Deci & Ryan, 1985b; Williams et al., 1999). Modifications were made to the existing TSRQ scales that have been used to address the risk behavior of alcohol use. Simple alterations of wording were made to orient the stem of the item toward sexual risk behavior. Specifically, “use alcohol responsibly” was changed to “not engage in sexual risk behavior” in the 15 items of the measure. The adapted TSRQ was entitled TSRQ - Healthy Sexual Behavior for the purposes of this study (see Appendix F).

The TSRQ (Ryan & Connell, 1989; Williams et al., 1996) consists of three sub-scales that represent three types of responses. The three types of responses were the autonomous (six items), controlled (six items), and amotivation (3 items). The autonomous sub-scale consists of 15 items using a seven-point Likert type scale with a range from “not at all true” to “very true”. Scoring of the TSRQ is typically accomplished by averaging the scores on each of the three sub-scales (autonomous items, controlled items, amotivation items) to form the expression of that type of motivation (autonomous, controlled, amotivation) for the target behavior. Thus, each sub-scale can

be used independently. However, in most research, questions cannot be answered by examination of the autonomous and controlled categories of motivation. When using the two major categories, a Relative Autonomous Motivation Index can be produced by subtracting the controlled items' average from the autonomous items' average. Since the TSRQ is adapted for each behavior studied, and since the examination of adolescents' motivation to not engage in sexual risk behavior was exploratory, the use of all three sub-scales was used to establish baseline scores for each of the three motivation responses and to minimize bias of the responses. However, the score from the autonomous items were used independently of the scores from the controlled and amotivation items. The scores on the autonomous motivation sub-scale had a range from 6 to 42. The scores on the controlled motivation sub-scale had a range from 6 to 42. The scores on the amotivation sub-scale had a range from 3 to 21.

Conceptualization of the Scale

Assessment of intrinsic motivation provided a measure of adolescent autonomous motivation. A proposition of SDT (Deci & Ryan, 1985b; Ryan, Deci et al., 1995) was that intrinsic motivation occurred through satisfaction of three primary psychological needs: competence, autonomy, and relatedness. The autonomous style represented the most self-determined form of motivation and was consistently associated with maintained behavior change and positive health-care outcomes. Consistently, people who felt more competent with regard to a particular behavior were found to be more likely to make and maintain the change and to evidence positive health care outcomes.

Psychometric Properties

The TSRQ (Ryan & Connell, 1989; Williams et al., 1996) that was used to assess motivation for smoking cessation was used in two studies, a preliminary study and a primary study of male and female high school students (Williams et al., 1999).

Cronbach's alphas of the measure were .89 and .88 for males and females, respectively.

The authors indicated that the measure was reliable and valid; perceived autonomy supportiveness of the intervention presentation was positively associated with autonomous reasons for smoking cessation (preliminary study) and with increases in autonomous motivation for not smoking (primary study). The change in autonomous reasons for smoking cessation significantly ($p < .001$) predicted smoking reduction during a four-month period.

Researchers (Ryan, Plant et al., 1995) who used the adapted TSRQ (Ryan & Connell, 1989; Williams et al., 1996) to assess motivations for alcohol addiction treatment, found that a principal components factor analysis of the 26-item version produced four factors with Cronbach's alphas ranging from .70 to .98. An invariance analysis across four sites was conducted to test the validity of the theoretical structure of the TSRQ (Levesque et al., 2007). The health behaviors examined across the four sites were tobacco, diet, and exercise. The samples ($N = 2,731$) of males and females all consisted of adults 18 years of age or older. A four-factor structure was validated across the four different sites providing strong support for the construct validity of the 15-item questionnaire. The four factors were amotivation, external regulation, introjection, and autonomous motivation. Autonomous motivation was found to be positively associated with positive health outcomes (i.e., greater levels of physical activity); introjection,

external regulation, and amotivation were found to be positively associated with negative health outcomes (i.e., depression).

Limitations of the Measure

Although there was evidence to support the reliability and validity of other versions of the TSRQ, a modification was made for this study. This measure will be subjected to psychometric testing in a pilot study with a sample of male and female late adolescent college students selected from the general population of college students.

Adolescents' Sexual Risk Knowledge

Purpose and Description

The STD-Knowledge Questionnaire (STD-KQ) was used to measure adolescent's reported sexual risk knowledge (Jaworski & Carey, 2007). The STD-KQ is a comprehensive measure of STD knowledge consisting of 27 items. Six of the most prevalent STDs are included in the items of this measure (i.e., chlamydia, genital herpes, gonorrhea, hepatitis B, HIV, and the Humanpapilloma Virus). Scoring was based on 1 point each for each correct "true" or "false" response and zero for a "don't know" response. These items were summed and a higher score demonstrated more knowledge about STDs. The range of possible scores was 0 to 27.

Conceptualization of the Scale

The STD-KQ (Jaworski & Carey, 2007) was based on the Information-Motivation-Behavior Skills model (Fisher & Fisher, 1992); knowledge (termed

information) was proposed to be a distinct construct and was believed to influence behavior either directly or indirectly along with motivation, through behavioral skills. The lack of a comprehensive STD questionnaire prompted the development of the STD-KQ. Almost half of the annual 19 million new STDs infect young people between the ages of 15 to 24 (Weinstock et al., 2004). Therefore, alternative scales such as the International AIDS Questionnaire (Davis, So-Kum Tang, Fiona Chan, & Noel, 1999) were deemed limited in scope by only addressing HIV/AIDS.

Psychometric Properties

Reliability and validity was established through a series of five studies (Jaworski & Carey, 2007) for the purposes of item development ($N = 40$; 55% female), expert review, pilot testing ($N = 50$; 82% female) and psychometric evaluation ($N = 391$; 84% female), test re-test reliability ($N = 80$; 85% female), and convergent validity ($N = 208$; 79% female). Internal consistency reliability was good for the sample of male and female college adults including late adolescents (Cronbach's $\alpha = .86$). The test-retest reliability over a two-week period was acceptable ($r = .88$). Confirmatory factor analysis supported two factors of a cause/cure and general knowledge of STDs. Convergent validity was established ($r = .64, p < .01$) in a comparison of the measure with a HIV specific knowledge questionnaire (Carey & Schroder, 2002).

Limitations of the Measure

Although, there was evidence of support for reliability and validity across a wide range of college students, there was no guarantee that reliability and validity would be the

same in adolescents of a narrower age range (19- and 20-year-olds) who were from different types of post-secondary institutions. However, this measure was piloted prior to the primary study with a sample of male and female late adolescent college students selected from the general population of college students. Certain types of sexual knowledge were not assessed, such as knowledge about pregnancy prevention and different forms of birth control.

Adolescents' Sexual Risk Behaviors

Purpose and Description

Sex risk behaviors were assessed using the Adolescent Risk Inventory (ARI) Sex Risk sub-scale and the HIV Prevention and Self-Efficacy sub-scale (Lescano et al., 2007). The impetus for the development of the inventory was the need for a comprehensive short measure to be used in a clinical setting. Comparable measures, The Youth Risk Behavior Survey (CDC, 2008) and The National Longitudinal Study of Adolescent Health (Harris et al., 2008) while comprehensive, were very lengthy; the respective completion time was estimated to be over 40 minutes for the former and the latter was 135 pages long. The ARI was derived from longer measures and has 20 items with seven sub-scales; i.e., three behavioral and four attitudinal sub-scales. The three behavioral sub-scales were revealed from exploratory factor analysis of behavior items. The three behavior sub-scales are Sex Risk, Abuse/Self-Harm, and Acting Out. The four attitudinal sub-scales were derived from confirmatory factor analysis of attitudinal items. The four attitudinal sub-scales are HIV Anxiety, HIV Prevention and Self-Efficacy,

General Distress, and General Risk. Items were framed in a dichotomous response format (yes = 2, no = 1).

Two sub-scales were used in this study, the Sex Risk sub-scale and the HIV Prevention and Self-Efficacy sub-scale. Of the seven total items on the Sex Risk sub-scale, five items were scored directly from the participant's dichotomous responses; the score from the first five items on the Sex Risk sub-scale ranged from 5 to 10. The last two items on the sex risk sub-scale required that the participant indicate quantity of sexual behavior, i.e., the number of times he or she has had sex in the past year and the number of sexual partners in the past year. The last two items were recoded as outlined in the instructions for this measure. The number of times the participant had sex in the past year was recoded on a one to three scale (none = 1, one to five = 2, six or more = 3). The number of sex partners in the past year response was recoded on a one to three scale, as well (none = 1 and one = 2 and two or more = 3). The range of scores for the entire Sex Risk sub-scale was 7 to 16.

The score from the items on the HIV Prevention and Self-Efficacy sub-scale ranged from 3 to 6 resulting from three items. Each of the three items were scored based on the dichotomous response format (yes = 2, no = 1). The two sub-scales used in this study (Sex Risk and HIV Prevention and Self-Efficacy) were listed on the same page and entitled Sexual Behavior Inventory (SBI). However, the scores were separately computed and analyzed.

Conceptualization of the Scale

Based on an implied social-psychological and behavioral epidemiological theory

(Jessor, 1991), the ARI was designed to assess multiple adolescent risk behaviors and attitudes. Jessor's theory suggests that there are organized patterns of adolescent risk behaviors and that one risk behavior can lead to other risk taking behaviors.

Psychometric Properties

A convenience sample of 134 youth who were 12- to 19-years-of-age, 61% female, with psychiatric disorders (i.e., mood disorders, disruptive behavior, posttraumatic stress disorder, and others) was used to establish initial psychometric properties. Internal consistency reliabilities (Cronbach's alpha) ranged from .53 to .80, including Cronbach's alpha of .72 for the Sex Risk sub-scale, .80 for the Abuse/Self-Harm sub-scale, .53 for the Acting Out sub-scale, .58 for the HIV Anxiety sub-scale, .72 for the HIV Prevention Self-Efficacy sub-scale, .58 for the General Distress sub-scale, and .60 for the General Risk sub-scale. Construct validity was established using factor analysis. Exploratory factor analysis was conducted on the behavior sub-scales revealing six factors with eigenvalues greater than 1.00. After a more stringent test (O'Connor, 2000) of factor extraction, three factors (sex risk, abuse/self-harm, acting out) met the criteria. Confirmatory factor analysis on the four attitude sub-scales (HIV Anxiety, HIV Prevention and Self-Efficacy, General Distress, and General Risk) revealed excellent goodness of fit statistics, specifically, a CFI of .991 for the HIV Prevention and Self-Efficacy sub-scale. These analyses suggested that the ARI could be useful in quickly identifying the broad range of risk behaviors found among adolescents with psychiatric disorders.

Limitations of the Measure

The ARI scale (Lescano et al., 2007) had been previously used with low-risk community youth who have psychiatric disorders. Although scores on the seven subscales were not significantly different between diagnostic categories [mood disorders, disruptive behaviors, post-traumatic stress disorder, and other (e.g., obsessive-compulsive disorder, substance use disorder)], it was unknown if the general population of adolescents in this study would demonstrate similar levels of reliability as shown in the Lescano et al. study. However, the questions are similar to those used in the general population such as those in the Youth Risk Behavior Survey (CDC, 2008) and The National Longitudinal Study of Adolescent Health (Harris et al., 2008). This SBI was piloted with a sample of late adolescent male and female college students selected from the general population of college students.

Pilot Study

Pilot testing was completed with a sample of 19- and 20-year-olds to determine the feasibility of study procedures, preliminary reliability of study measures, and variability of item responses. Responses to recruitment, problems with questionnaire administration, completion time, and collection issues were noted. IRB approval was obtained (see Appendix C - 1). The site for the pilot test was a common area where large portions of the students were known to congregate during breaks and meals. A sample size of 15 to 25 adolescents was planned. The pilot and full-scale study employed the more traditional pen and pencil format. All previously described methods of recruitment and questionnaire administration were followed. Timing of completion of the pilot

questionnaire was estimated to be no more than 20 minutes. The pilot was conducted until the planned sample size was recruited.

Data Analysis Plan

Basics and Data Quality

Data entry and data analyses was accomplished using SPSS software, 14.0 (Norusis, 1993). In addition, the structural equation modeling/path analysis software used was LISREL (Jöreskog & Sörbom, 1993). All analyses had a significance level of $p < .05$. Data was coded and manually entered into software packages directly from completed questionnaires. Data entries were checked for accuracy of data entry. Data was inspected for outliers (values outside the normal range), wild codes (code that is not possible), irregularities (consistency among data), and missing data. Data cleaning was done on a case-by-case basis as necessary. Imputation for missing data was determined by a case-by-case basis (e.g., mean, linear imputation). A codebook was used to describe codes assigned to the variables and to record data cleaning details and any changes made to the original data during the cleaning processes.

Description of Sample

Frequencies were used to describe the sample participant's gender and ethnicity, current living arrangements, parents' education, parents' occupation, and family structure. Descriptive statistics (means and standard deviations) were used to describe participant's age and parent's age. The ranges, means and standard deviations of the scores on each instrument were reported to assess the variation of scores (standard

deviations close to the mean reflected a narrower range of scores while standard deviations not close to the mean indicated a wider range of scores) on each instrument.

Assessment of Measures

Reliabilities of the instruments in the study's sample were assessed with Cronbach's alpha. Identification of significant covariates were accomplished using the bivariate correlation matrix and the review of literature. In addition, factor analysis was performed on the tool entitled TSRQ - Healthy Sexual Behavior to assure a factor loading of at least .40 per item.

Correlation Matrix

A correlation matrix was developed to determine the intercorrelations (Pearson's r) among the demographic variables, parent-adolescent sexual risk communication (mother and father), parental autonomy support (mother and father), adolescent autonomous motivation, adolescent sexual risk knowledge, and adolescent sexual risk behavior. Findings were evaluated for consistency of proposed relationships to each other according to the conceptual model (see Figure 1).

Multicollinearity of mother-adolescent and father-adolescent sexual risk communication and mother and father autonomy support were assessed (i.e., determine if the coefficients of the sample differ drastically when dividing the sample in two parts, tolerance value and its reciprocal, or condition index). If multicollinearity had existed, the scores of the two variables would have been combined to form one parental variable for either sexual risk communication or autonomy support or both. However,

multicollinearity did not exist; the four variables of mother-adolescent sexual risk communication, father-adolescent sexual risk communication, mother autonomy support, father autonomy support were entered into models separately.

Path Analysis

The scores from the HIV Prevention and Self-Efficacy sub-scale were not used in this study's analyses due to a design flaw in the sequencing within the questionnaire packet, whereby the HIV Prevention and Self-Efficacy sub-scale questions were embedded in one measure entitled the Sex Risk sub-scale. A stem was created following the pilot allowing those participants who were not sexually active to stop after responding negatively to ever having had sexual activity, and thereby, the HIV Prevention and Self-Efficacy sub-scale and the Sex Risk sub-scale were omitted. As a result, 69 out of 75 sexually inactive participants did not complete the HIV Self-Efficacy Scale. While answers were imputed based on lack of sexual activity for the Sex Risk sub-scale, answers could not be imputed for an attitude scale (HIV Prevention and Self-Efficacy sub-scale). Because the HIV Prevention and Self-Efficacy sub-scale was one of two latent variables that assessed sexual risk behavior, only one measure of sexual risk behavior remained. Therefore, this study's data analysis method was changed from structural equation modeling to path analysis. Dummy latent variables were created for each of the variables to be used in the path analysis.

Path analysis requires that variables be identified as either exogenous (those variables that have an effect on other variables and are classified as independent or predictor variables) or endogenous (those variables that are affected by other variables

and are classified as dependent variables). However, in path analysis independent variables might function as exogenous or endogenous. In this study, the exogenous variables are parent- (mother or father) adolescent sexual risk communication, parental (mother or father) autonomy support, and adolescent autonomous motivation (modeled as a mediating variable). The endogenous variables of adolescent sexual risk knowledge and adolescent sexual risk behavior are also considered exogenous.

A causal model was constructed to determine the effects of the exogenous variables on the endogenous variables algebraically using path analysis, where each variable was adjusted for its effect on the dependent variable. Models were examined by comparison of the predicted and observed covariance matrices, *t*-tests for individual path coefficients, and other model diagnostics. After successive models were fitted, only significant variables were retained resulting in the best-fitted model. The trimmed model resulted in path coefficients and a path diagram that contained only significant paths. A path analysis model was presented that estimated the complicated relationships among the variables studied.

A variety of standard fit indices cited as most commonly reported in the literature and as having the least undesirable properties (Munro, 2005) were chosen to report for this study's model. Model diagnostics included the relative chi-square = χ^2/df ; goodness-of-fit (GFI), adjusted goodness-of-fit (AGFI), comparative fit index (CFI), non-normed fit index (NNFI), standardized root mean squared residual (SRMSR), and the root mean square error of approximation (RMSEA).

T-tests (Wald's test) of the significance of each estimated path were examined, and non-significant paths were subsequently fixed to zero to improve model fit and

parsimony. The chi-square test was used as the traditional overall test of fit, testing the null hypotheses as no differences (see Figure 1). Finally, modification recommendations were considered to identify paths that could be included to improve the overall fit of the model.

CHAPTER 4

FINDINGS

Pilot Study

A pilot study was conducted to determine the feasibility of study procedures, preliminary reliability of study measures, and variability of item responses before the main study was implemented. Of the 20 university students screened and enrolled in the pilot study, 14 students' findings were assessed for the purposes of the pilot study.

Feasibility of Study Procedures

The convenience sample of adolescents was recruited from a main thoroughfare in front of a cafeteria and bookstore. Individuals responded favorably to personal approaches by the principal investigator. Minimal effort was required to attain the sample. Reasons the eligible individuals did not participate were not having the time and not wanting to participate.

The flyer (see Appendix B), which reviewed the purpose of the study and the inclusion criteria, proved a useful tool in the intercept approach to potential participants. All flyers and questionnaires were handed out and collected by the principal investigator. Participants either completed the questionnaire at the collection site where there were private places to sit or took it with them and returned it during the hours posted on the collection table. Some participants took the questionnaire, completed it while on a break from classes, and returned it afterwards.

It was noted that, when individuals were approached as a group, the group tended to stay congregated while completing the questionnaire. Therefore, to minimize

collaboration among participants, the investigator directed participants to sit apart when possible, and reminded all participants that they should not discuss their responses with each other during completion of the questionnaire.

The participants were given an incentive of a \$5 food gift card upon completion of the questionnaire. The questionnaire was completed within the projected 15 – 20 minutes. The best data collection times for accessing students were from mid-morning until mid-afternoon on weekdays.

In order to have as homogeneous a sample as possible, the sample used for data analysis was limited to participants who indicated their biological parents were living. The following cases were excluded from the data analyses. Data from participants ($n = 4$) who had a biological parent who was not living were excluded. Also excluded were data from two participants who reported that their parents were not their biological parents.

Univariate Analyses

Description of the Sample

A description of the sample appears in Table 1. The pilot sample was predominately female and Caucasian. More females than males were available in the locations chosen, and more females than males were receptive to intercept and participation. Other sample characteristics not listed in Table 1 include family structure and mothers' and fathers' education. Fifty-seven percent of the participants reported that their biological parents were married and living together; 43% of participants reported their biological parents were separated or divorced. All participants ($N = 14$) reported

Table 1

Pilot Study Sample Characteristics (N = 14)

Variables	<i>N</i>	%	<i>M</i>	<i>SD</i>	Range
Gender					
Female	10	71			
Male	4	29			
Ethnicity					
African American	3	21			
White	11	79			
Live with Parents	14	50			
Participant's Age (years)	14		19.50	0.52	19 – 20
Mother's Age (years)	14		47.36	5.93	36 – 55
Father's Age (years)	14		50.64	6.90	40 – 65

that their parents ($N = 28$) had at a minimum a high school education; the mode ($n = 7$) of mothers' educational level was a minimum of one year of college or specialized training and the mode ($n = 5$) of fathers' educational level was college graduate (see Figure 2).

Data on parents' occupation were incomplete and precluded further analysis.

Dispersion and Variability

The dispersion of scores on the measures is listed in Table 2. Scores were varied as evidenced by the by the distances represented by the respective standard deviations

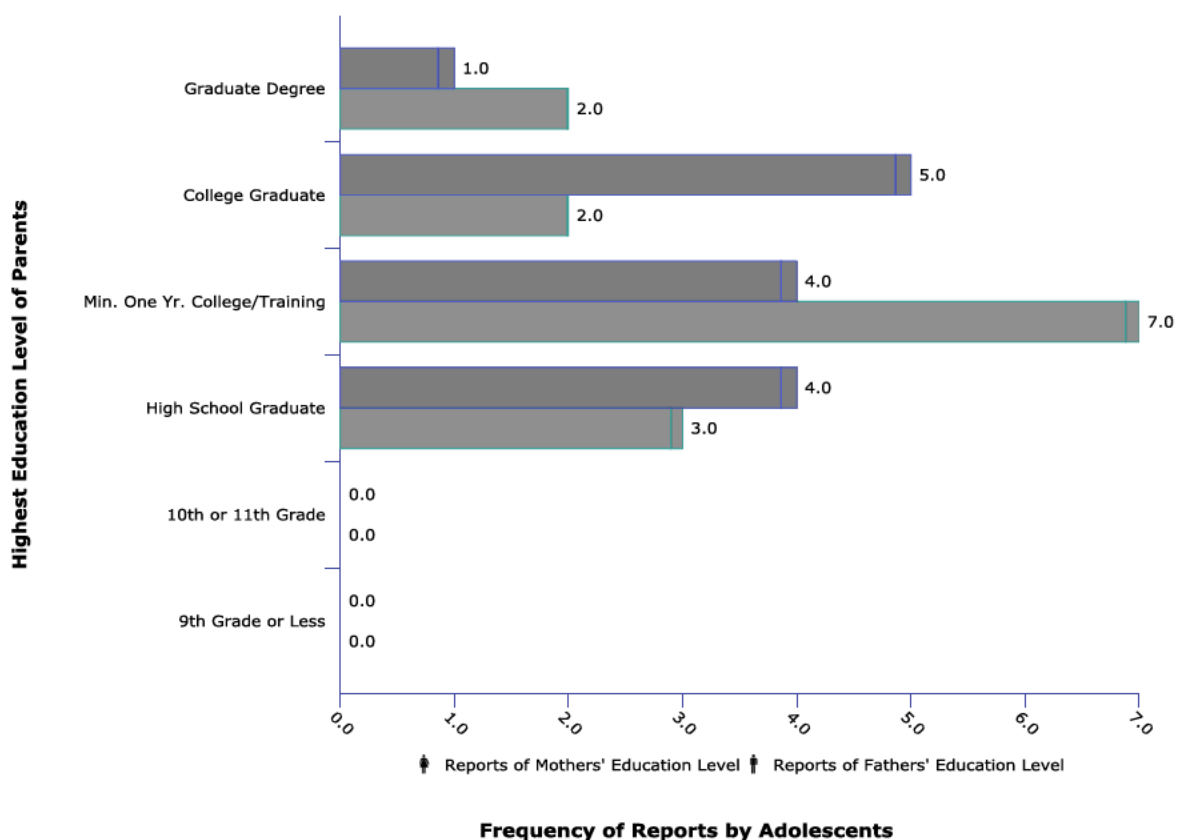


Figure 2. Pilot Study: Reports of Mothers' and Fathers' Highest Education Level ($N = 28$).

and ranges. The ranges of scores on each measure were consistent with the ranges reported by other researchers who used the respective scales.

Pretest of Study Measures

Several problems were noted with the questionnaires. Some participants had difficulty recalling their parents' occupations. Therefore, the question about the parents' occupation was reworded and expanded to provide clarity. Questions about school enrollment and the amount of the program of studies that had been completed were deleted because they were confusing and did not add significantly to the sample

Table 2

Pilot Study Measures' Statistics

Measure	<i>N</i>	<i>M</i>	<i>SD</i>	Range	Scale Range	α
PTSRC-III	14	22.21	8.87	9 – 37	8 – 40	.94
Mother						
Father	14	16.57	9.50	8 – 36	8 – 40	.93
POPS						
Mother	14	48.64	9.23	29 – 63	9 – 63	.85
Father	14	44.14	12.46	27 – 63	9 – 63	.89
TSRQ	14	31.93	10.50	6 – 42	6 – 42	.96
STD-KQ	14	16.07	6.13	2 – 24	0 – 27	.87
HIV Prevention Self-Efficacy	13	5.38	.77	4 – 6	3 – 6	.23
SBI – Sex Risk sub-scale	14	9.64	2.47	7 – 15	7 – 16	.78

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory.

description. A new question was developed to verify eligibility for this study. The participants answered whether they had been enrolled at the college during the current academic year.

Some participants had difficulty responding to questions on the SBI (Sexual Behavior Inventory) that asked if they had ever had sex /sexual intercourse. Therefore, instructions were added to the SBI directing those participants who indicated they never had sex/sexual intercourse to stop answering follow-up questions if they answered 'no' to

the new preliminary question about whether or not they had ever had sex. In addition, sexually active participants who had been abstinent during the past 12 months had difficulty with questions asking about the frequency of sexual experiences during the last 12 months. Additional instructions were added so that a participant who answered zero to the question about the frequency of sexual intercourse could stop and not respond to follow-up sex/sexual intercourse questions. Based on the responses in the pilot study, the terms sex/sexual intercourse were substituted for “sex”. Definitions of sex/sexual intercourse as oral, anal, or penile/vaginal intercourse were included. In addition, any instructions to the participant to consider the past year were underlined on the SBI form to emphasize the time frame the participants were to consider. The “not applicable” response option on the SBI was removed; “not applicable” was no longer needed once new instructions were provided. The revised questionnaire is included as Appendix F-2.

Reliability of the instruments (see Table 2) was assessed with Cronbach’s alpha. The pilot study analysis suggested that all measures except the HIV Prevention Self-Efficacy measure had acceptable reliabilities. The dispersion of scores and internal consistency reliabilities of all measures (except the HIV Prevention and Self-Efficacy sub-scale) are consistent with reports of other investigators. The lower reliability and inconsistent dispersion of scoring of the HIV Prevention Self-Efficacy measure may have been a result of the small pilot sample size (Field, 2005a), and the short test length (Waltz et al., 2005). Therefore, the measures were deemed appropriate for use with university students and were retained for implementation in the larger study.

Main Study

Preliminary Analysis

Based on findings from the pilot study, a preliminary analysis was conducted to examine the sample for homogeneity. In order to have as homogeneous a sample as possible, certain cases were excluded from the data analyses. The desire was to have two-parent families so that both mothers' and fathers' influence could be included in the model, thus limiting the sample to those families where two biological parents were still living and where the subject of the participants' responses related to parental influences.

As a result, participants ($n = 20$) who had a biological parent not living or did not mark whether a parent was living or dead were excluded from this study's data analysis. Participants ($n = 25$) who did not report biological parents as the subject of parent-figure responses on the parent-adolescent scales (PTSRC-III, Parent-Teen Sexual Risk Communication Scale-III; POPS, Perception of Parents Scales), were excluded from this study's data analysis; inconsistencies could result from including data about parent figures other than biological parents. Participants ($n = 26$) who had missing data on any one of the six scales were also excluded from this study's data analysis. There were overlaps in these exclusion categories. Of the 309 university students screened and enrolled in this study, 249 were included in the analyses conducted to examine the relationships among parent-adolescent (mother or father) sexual risk communication, parental (mother or father) autonomy support, and adolescents' autonomous motivation, sexual risk behavior, and sexual risk knowledge.

Chi-square analysis was used to test for any significant differences in the study's demographic variables between those participants who were included in the study ($N =$

249) and those who were not included in the study ($n = 60$). There was a significant relationship of race/ethnicity with inclusion of the participant in the analysis of the study's model (see Table 3). Hispanic/Latino, Asian/Pacific Islander, or

Table 3

Differences Between Participants Retained and Deleted From Study (N = 309)

Variable	Degrees of Freedom	<i>p</i> Value	Chi-Square
Race/Ethnicity	4	< .001	15.87
Mother Education	1	>.05	2.48
Father Education	1	>.05	3.52
Gender	1	>.05	0.02
Age	1	>.05	2.28
Lived with Parents	1	>.05	0.14

Caucasian/White participants were more likely to be included in this study's final sample than African Americans or other ethnicities. However, 30% of cells in the analysis had an expected count of less than five. Therefore, loss of statistical power may have occurred. There were no significant relationships (see Table 3) of mother's education and father's education with the inclusion of the participant in this study's final sample. However, 36% and 30% of cells in the analysis had an expected count of less than five for mother and father's education, respectively. Relationships (see Table 3) of gender, age, and whether participants lived with parents or not, were not associated with the

inclusion of the participant in this study's final sample.

Study Data Analysis

Univariate Analyses

Description of the sample. A convenience sample of adolescents was recruited from a campus library, recreation center, and a main thoroughfare in front of a cafeteria and bookstore. Reasons the eligible individuals did not participate were not having the time and not wanting to participate. Data collection took place over two semesters.

A description of the sample appears in Table 4. The sample was predominately female (60.6%) and Caucasian (60.2%). Fifty-five percent of the sample were 19 year-olds and 45% were 20-year-olds. Sixty-six percent of participants reported that their biological parents were married and living together and 34% of participants reported that their biological parents were separated or divorced. In addition, participants ($N = 249$) reported that the majority of their parents ($N = 497$) were educated past high-school. The mode ($n = 96$) of mothers' educational level was college graduate and the mode ($n = 77$) of fathers' educational level was a minimum of one year of college or specialized training (see Figure 3).

Measures

Dispersion and variability. The dispersion of scores from each of the measures is listed in Table 5. Scores were varied as evidenced by the distances represented by the respective standard deviations, ranges, and interpercentiles. The range of scores

Table 4

Sample Characteristics (N = 249)

Variables	<i>N</i>	%	<i>M</i>	<i>SD</i>	Range
Gender					
Female	151	60.6			
Male	98	39.4			
Ethnicity					
African American	57	22.9			
Asian/Pacific Islander	29	11.6			
Caucasian/White	150	60.2			
Hispanic/Latino	6	2.4			
Multi-Racial	6	2.4			
Other	1	0.4			
Live with Parents	102	41.0			
Sexually Active	174	70.0			
Participant's Age (years)			19.44	0.50	19 – 20
Mother's Age (years)			47.76	5.25	36 – 62
Father's Age (years)			50.02	6.00	36 – 69

Note. All variables were reported in 249 cases except Mother's Age ($N = 248$) and Father's Age ($N = 247$).

on each measure was consistent with prior reports of ranges from use of the respective scales.

Table 5
Measures' and Their Statistical Properties

Measure	<i>N</i>	<i>M</i>	<i>SD</i>	Range	Scale Range	α
PTSRC-III						
Mother	249	21.47	8.34	8 – 40	8 – 40	.93
Father	249	16.05	8.14	8 – 40	8 – 40	.94
POPS						
Mother	249	44.94	10.65	15 – 63	9 – 63	.88
Father	249	45.22	10.81	13 – 63	9 – 63	.86
TSRQ	249	31.72	8.19	6 – 42	6 – 42	.88
STD-KQ	249	14.86	5.83	0 – 26	0 – 27	.85
SBI – Sex Risk sub-scale	249	9.94	2.31	7 – 15	7 – 16	.72

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory.

Distribution Shape - Symmetry and Kurtosis. Responses on all but two measures (SBI, Sexual Behavior Inventory; Mother PTSRC-III, Parent-Teen Sexual Risk Communication Scale-III) had skewness (departure from symmetry) (see Table 6); according to Fisher's Measure of Skewness (Hildebrand, 1986), *z* scores above 1.96 or below -1.96 indicate significant skewness.

All measures had flat distributions indicating a more varied distribution of scores than a normal curve's scores. The two measures, the Mother PTSRC-III and the SBI also demonstrated a large negative kurtosis (also examined by *z* score). Due to the severe

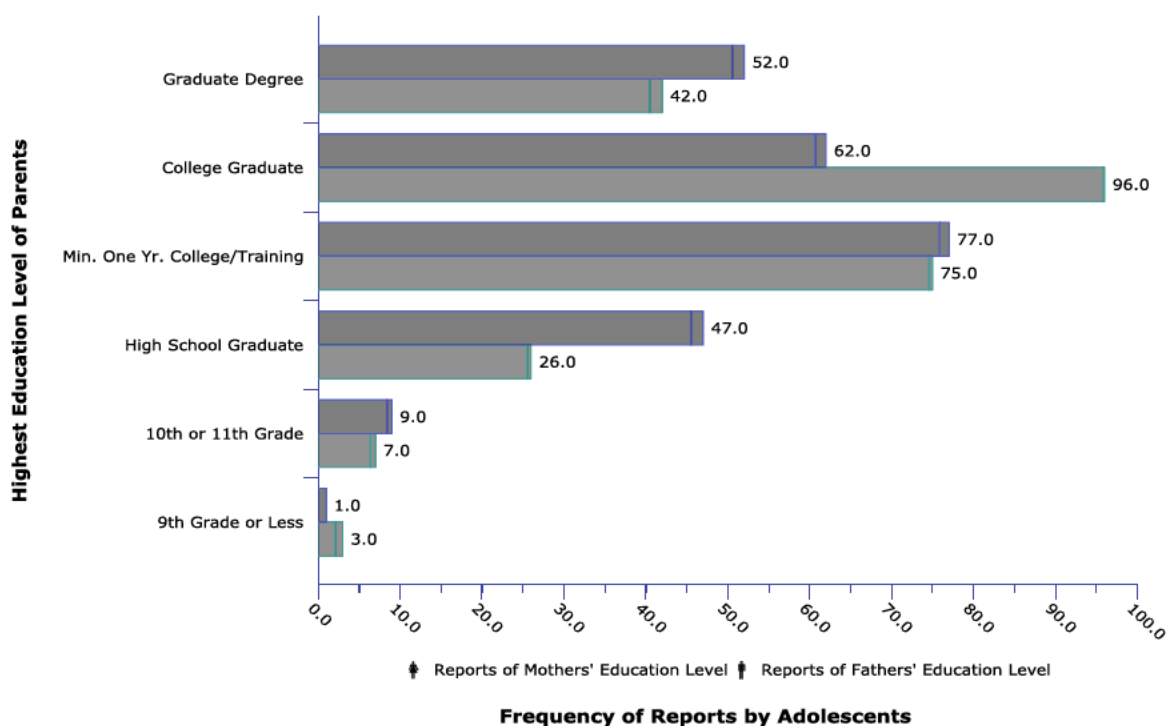


Figure 3. Main Study: Reports of Mothers' and Fathers' Education Level ($N = 497$).

skewness or kurtosis of all of the measures (see Table 6), the measures' interpercentiles (see Table 7) were used to examine further variation of the scores of the independent and dependent variables (see Figure 1).

Parent-Teen Sexual Risk Communication Scale-III. Both parents' measures scores were positively skewed, indicative of scores clustered around lower scores of the possible range of scores. Indeed, seventy-five percent of the father PTSRC-III (Parent-Teen Sexual Risk Communication Scale-III) (Hutchinson, 2007) scores fell below 21, whereas 50% of the mother PTSRC-III scores fell below 21 (see Table 7). Parent-teen sexual risk communication scores below 24 are considered moderate and scores below 16 are considered low (Hutchinson & Cooney, 1998). Furthermore, 27% of adolescents

Table 6.

Measures' Symmetry and Kurtosis

Measure	Skewness	Std. Error of Skewness	z Score	Excess Kurtosis	Std. Error of Kurtosis	z Score
PTSRC-III						
Mother	.22	.15	1.45	-.79	.31	-2.58
Father	.89	.15	5.80	-.09	.31	*
POPS						
Mother	-.54	.15	-3.48	-.49	.31	*
Father	-.39	.15	-2.51	-.60	.31	*
TSRQ	-.71	.15	-4.58	-.07	.31	*
STD-KQ	-.42	.15	-2.71	-.40	.31	
SBI – Sex Risk sub-scale	-.06	.15	-.39	-1.29	.31	-3.48

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory. * Kurtosis z score was not computed; if skewness is not normal there is no need to examine kurtosis because the distribution is not normal (Munro, 2005).

reported no father sexual risk communication, whereas 5% of adolescents reported that their mothers provided no sexual risk communication.

Father PTSRC-III scores were consistently lower than mother PTSRC-III scores in every percentile. With a possible range of 8 - 40, these scores indicated a wide range of reports from adolescents about the amount their parents communicated about sexual risk. However, extreme scores are not unexpected in a large sample reporting parental

Table 7.

Measures' Interpercentiles

Measure	Percentile				
	10 th	25 th	50 th	75 th	90 th
PTSRC-III					
Mother	11	14.5	21	27.5	33
Father	8	8	14	21	29
POPS					
Mother	29	37	47	53	58
Father	29	38	46	54	59
TSRQ	20	26	33	38	42
STD-KQ	7	11	15	19	22
SBI – Sex Risk sub-scale	7	7	10	12	13

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory.

communication where some parents may provide no sexual risk communication versus others who may provide everything about sexual risk communication.

Perception of Parents Scales. Adolescents perceived their mothers and fathers similarly on autonomy supportiveness (see Table 7), yet more adolescents scored fathers higher than their mothers on autonomy support at the 25th, 75th, and 90th percentiles. Extreme scores were expected.

Treatment Self-Regulation Questionnaire. Scores on the Treatment Self-Regulation Questionnaire (TSRQ) covered the full range (6 – 42) of possible scores. Only 10% of adolescents reported scores less than 20. Therefore, 90% of adolescents perceived themselves as somewhat to very autonomous in their motivation about their sexual behavior (see Table 7). Indeed, 10% of adolescents had the maximum score of 42. All but one adolescent in this sample perceived themselves as being autonomously motivated about their sexual behavior.

STD-Knowledge Questionnaire. Fifty percent of adolescents scored less than 15 out of a possible 27 on the STD-Knowledge Questionnaire, STD-KQ (see Table 7); almost 2% of the adolescents scored 0 out of a possible score of 27. Ten percent of the students scored above 22, but no adolescent scored a total score of 27. Overall, these scores reflect mostly moderate to low levels of knowledge about sexual transmitted disease.

Sexual Behavior Inventory. Thirty-one percent of adolescents had the lowest possible score on the Sexual Behavior Inventory (SBI), reflective of those adolescents who were not sexually active. Of those sexually active adolescents ($n = 174$), seven adolescents also had the lowest possible score on the SBI, indicating that some sexually active adolescents were at low sexual risk. Ninety-six percent ($n = 167$) of sexually active adolescents reported some degree of sexual risk. While no adolescent scored the maximum sexual risk score of 16, 89% of those sexually active adolescents reported scores of 10 or higher on the SBI. The full range of scores was expected, as some

individuals perceive themselves as totally without sexual risk and others perceive themselves as engaging in high degrees of sexual risk behavior.

Psychometric Assessment of Measures. Internal consistency reliability of each measure was assessed using Chronbach alpha (see Table 5). All reliabilities were acceptable (range = .72 to .94) and consistent with prior reports of each measure's reliability. Standard deviations and ranges of scores indicate satisfactory variation of measures' dispersions and are consistent with prior reports.

Because, the Treatment Self-Regulation Questionnaire (TSRQ) was modified for this study by altering wording to orient the stem of the item toward sexual risk behavior, factor loadings of the TSRQ scale items were examined. The items had factor loadings greater than .40 indicating satisfactory relationships between the revised scale items and the factor measured, in this case, autonomous motivation.

Multivariate Analyses

Correlation matrix. The correlation matrix generated in SPSS for the study's variables is displayed in Table 8. Correlations (Pearson's r) among the variables were evaluated for consistency of proposed relationships identified in the conceptual model (see Figure 1).

Multicollinearity of mother-adolescent and father-adolescent sexual risk communication and mother and father autonomy support were examined. Multicollinearity between the four parent variables, indicated by correlations above .80 or .90 (Field, 2005a), was not evident. Therefore, the individual variables of mother-

adolescent sexual risk communication, father-adolescent sexual risk communication, mother autonomy support, and father autonomy support were entered into the hypothetical model separately.

Path Analysis

Although examination of multivariate normality yielded detection of kurtosis and skewness, further examination of extreme scores indicated these scores represented actual scores. Based on the conceptual model and covariance matrix generated in PRELIS (see Table 9), a full baseline model (see Figure 4) was constructed to model and test the hypothesized relationships among the study variables of parent-adolescent (mother or father) sexual risk communication, parental (mother or father) autonomy support, and adolescents' autonomous motivation, sexual risk behavior, and sexual risk knowledge. Initially, models were generated using the raw data covariance matrix and model generation fluctuated between disallowing the error variances of parent variables to correlate and not correlate. In addition, models were explored using the normalization function; models were generated using normalized data, fluctuating between letting the error variance of parent variables correlate and not correlate. Next, separate models were explored for male and female participants, following the preceding guidelines. Next, models were generated from partial correlation matrices based on significant demographic variables, first, by controlling for one variable (gender) which was significantly correlated with numerous variables and second, by controlling for all demographic variables (gender, race/ethnicity, father's age, live with parents, mother's education, and father's education); see the correlation matrix in Table 8. At this point, all

Table 8

Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender	1														
2. Age	-.055	1													
3. Race/ Ethnicity	-.100	.104	1												
4. Mother's Age	-.084	.180**	-.026	1											
5. Father's Age	-.055	.183**	-.051	.786**	1										
6. Live with Parents	-.064	.149*	-.007	.038	.036	1									
7. Mother's Education	.032	.000	-.086	.123	.032	.097	1								
8. Father's Education	.048	.105	-.059	.283**	.268**	.013	.491**	1							
9. Parents' Marital	.103	.032	.115	-.252**	-.237**	.007	-.043	-.107	1						
10. PTSRC-III, Mother	-.143*	-.016	.034	-.014	-.026	.022	.154*	.075	.073	1					
11. PTSRC-III, Father	.330**	.031	-.036	-.086	-.031	.039	.096	.202**	.016	.453**	1				
12. POPS, Mother	-.046	.056	-.065	.065	.075	.123	.036	.004	.036	.252**	.017	1			
13. POPS, Father	-.160*	.020	-.235**	-.005	.079	.003	.114	.093	-.094	.232**	.255**	.088	1		
14. TSRQ	-.335**	-.020	.132*	.012	-.049	-.053	-.031	.053	.019	.141*	-.049	.127*	.160*	1	
15. STD-KQ	-.065	.032	.013	.115	.152*	.212**	.116	.209**	.009	.117	.002	.000	.029	.135*	1

16. SBI – Sex Risk sub- scale	-0.005	.120	-.076	-.015	.001	.182**	.070	-.057	.150*	.145*	.022	.004	-.017	-.230**	.096
-------------------------------------	--------	------	-------	-------	------	--------	------	-------	-------	-------	------	------	-------	---------	------

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory. All variables were reported in 249 cases except for Race/Ethnicity ($N = 248$), Father's Education ($N = 248$), and Father's Age ($N = 247$).

Table 9

Covariance Matrix to be Analyzed (N = 249)

Variable	1	2	3	4	5	6	7
1. PTSRC-III, Mother	69.597						
2. PTSRC-III, Father	30.741	66.292					
3. POPS, Mother	22.377	1.446	113.368				
4. POPS, Father	20.914	22.452	10.077	116.816			
5. TSRQ	9.619	-3.251	11.099	14.144	67.023		
6. STD-KQ	5.693	0.084	0.025	1.856	6.441	33.925	
7. SBI – Sex Risk sub-scale	15.470	1.666	-1.997	-2.223	-31.369	8.708	220.870

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory.

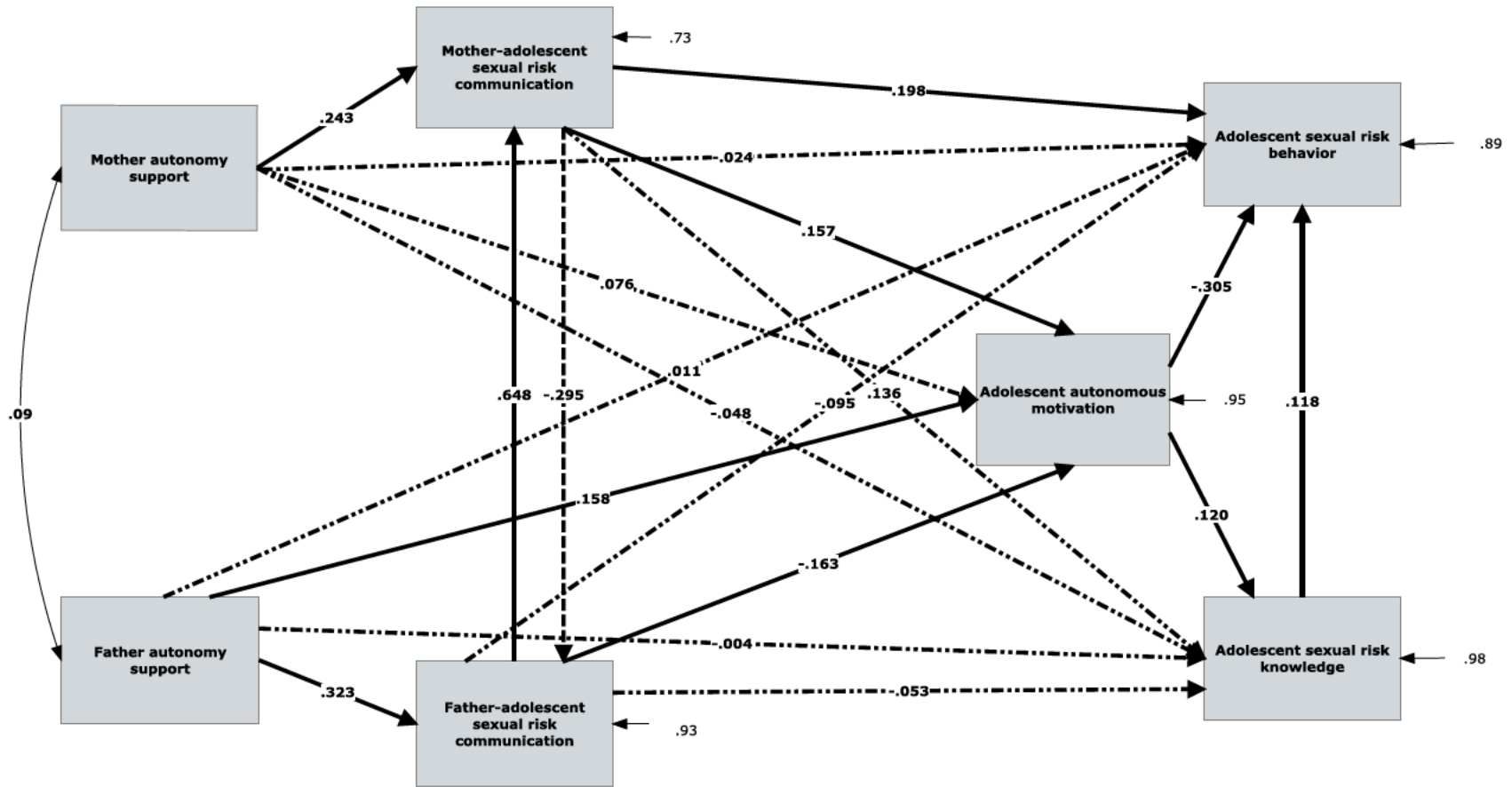


Figure 4. Baseline Model of Standardized Solutions.

Note. Proposed predictors of adolescent sexual risk behavior and sexual risk knowledge are shown here. The straight, solid lines represent hypothesized and not hypothesized significant paths ($p < .05$) and the straight, broken lines represent proposed paths that were not significant. Error variances are those numbers at the tails of the short arrows pointing to the predictors from right to left. The curved line with arrowheads at each end represents a covariance between two variables.

models had indices that were not satisfactory.

Reviewing the analyses for important parameters led to identification of a modification index (53.26) which suggested an alternative pathway (between mother-adolescent sexual risk communication and father-adolescent sexual risk communication) that improved the fit of the model to the data. The inclusion of the reciprocal pathway between mother-adolescent sexual risk communication and father-adolescent sexual risk communication was retained based on its conceptual consistency with the concept of marital interaction which has roots in systems theory and communication theory (White & Klein, 2002); system/communication theories suggest that the family represents a communication system.

The pathway between mother-adolescent and father-adolescent sexual risk communications was subsequently added to the syntax of the final model. Because the model based on the raw data fitted well, the decision was made to use the raw data for further analyses to ensure clarity in explaining the results and interpreting the model. In an effort to obtain a more parsimonious model, the full/baseline model was reduced by eliminating non-significant predicted paths. A fitted covariance matrix was generated (see Table 10) and a trimmed model (see Figure 5) was constructed after removing the least significant direct paths. The least significant direct paths were eliminated by removing non-significant predicted paths, (lowest t value) one at a time, until only statistically significant ($t \geq |1.96|, p < .05$) paths remained. All fit indices were acceptable in the modified model. To avoid any statistical artifacts resulting from manipulation of the data by normalizing it and using partial correlation matrices, the raw covariance matrix was used for subsequent trimming and analyses. A variety of standard

fit indices cited as most commonly reported in the literature and as having the least undesirable properties (Munro, 2005) were chosen to report for this study's model (see Table 11). The following indices indicate a good fit of the conceptual model to the observed data: a relative chi-square less than 3 (Carmines & McIver, 1983), a GFI, AGFI, or CFI greater than .90 (Bentler & Bonnett, 1980), a NNFI greater than .90 (Marsh, Balla, & Hau, 1996), a SRMSR and RMSEA close to zero and less than 0.05 (Hu & Bentler, 1995).

A correlation calculation is recommended (Ulman, 1996) between the full/baseline model and the trimmed model when post hoc model modifications are performed (Ulman, 1996). An extremely high correlation was observed ($r = .979, p < .01$), indicating stable parameter estimates for the statistically significant paths remaining after the non-significant paths had been deleted.

The final trimmed model (see Figure 5) contained only significant standardized solutions. Standardized solutions (also referred to as coefficients, paths, or parameter estimates) show the change in a dependent variable from a standard deviation change in an independent variable (Diamantopoulos & Siguaw, 2009). The standardized effects displayed indicated that mother autonomy support, father autonomy support, mother-adolescent sexual risk communication, father-adolescent sexual risk communication, and adolescent sexual risk knowledge directly or indirectly influenced adolescent sexual risk behavior. All individual indirect influences or simple path mediators were significant. Indirect paths were mediated through simple (one mediator) or micromediation chains (longer than two paths) distally through adolescent autonomous motivation. In addition, mother autonomy support, father autonomy support, mother-adolescent sexual risk

Table 10

Fitted Covariance Matrix (N = 249)

Variable	1	2	3	4	5	6	7
1. PTSRC-III, Mother	69.68						
2. PTSRC-III, Father	30.83	66.29					
3. TSRQ	8.56	-3.23	66.64				
4. STD-KQ	0.82	-0.31	6.40	33.92			
5. SBI – Sex Risk sub-scale	14.54	9.99	-31.46	7.41	220.26		
6. POPS, Mother	22.60	1.94	4.92	0.47	3.63	113.37	
7. POPS, Father	12.25	22.45	12.60	1.21	-3.07	10.08	116.82

Note. PTSRC-III = Parent-Teen Sexual Risk Communication Scale-III; POPS = Perception of Parents Scales; TSRQ = Treatment Self-Regulation Questionnaire; STD-KQ = STD-Knowledge Questionnaire; SBI = Sexual Behavior Inventory.

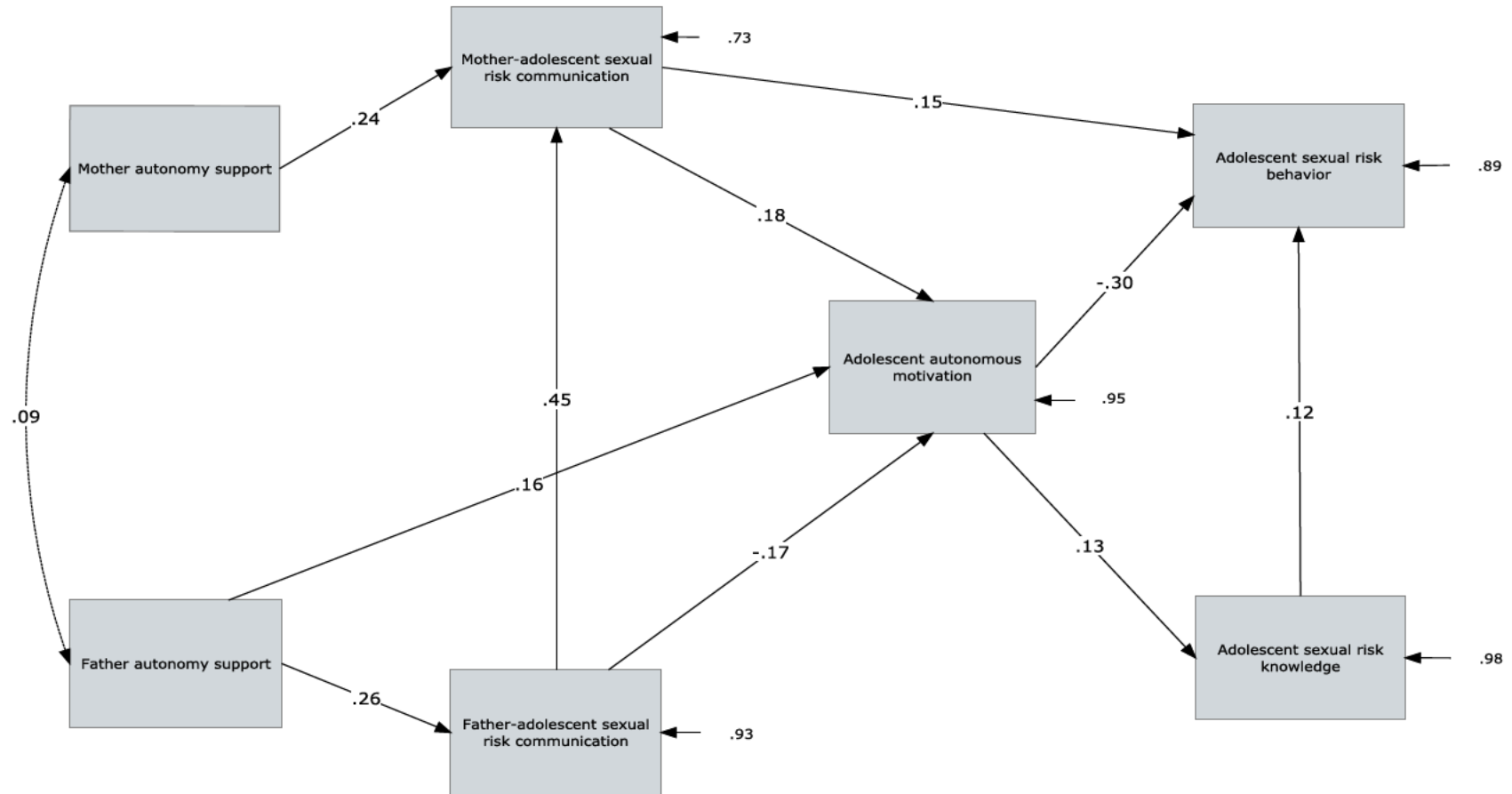


Figure 5. Trimmed Model of Standardized Solutions.

Note. Proposed predictors of adolescent sexual risk behavior and sexual risk knowledge after non-significant paths were eliminated. The straight, solid lines show only significant effects ($p < .05$). Error variances are those numbers at the tails of the short arrows pointing to the predictors from right to left. The curved line with arrowheads at each end represents a covariance between two variables.

Table 11

Fit Measures of Baseline and Trimmed Models

	$\chi^2(df)$	Relative Chi-Square	GFI	AGFI	CFI	NNFI	SRMSR	RMSEA
Full/Base- line Model	1.577(1)	1.587	.998	.949	.995	.902	.0150	.0484
Trimmed Model	10.22(11)	.930	.990	.970	1.00	1.000	.0340	.0000

Note. χ^2 = chi-square; df = degrees of freedom; Relative chi-square = χ^2/df ; GFI = goodness-of-fit; AGFI = adjusted goodness-of-fit; CFI = comparative fit index; NNFI = non-normed fit index; SRMSR = standardized root mean squared residual; RMSEA = root mean square error of approximation.

communication, and father-adolescent sexual risk communication indirectly influenced adolescent sexual risk knowledge; mediation spanned from simple to micromediation through the distal variable of adolescent autonomous motivation. The standardized model and calculations of indirect effects on adolescents' sexual risk behavior based on that model are listed in Appendix G and H.

While some researchers prefer using standardized solutions because the results are comparable across studies (Cheung, 2009), there is also a basis that using statistics in their original metrics (unstandardized estimates) can be interpreted as effect sizes (Preacher & Kelley, 2010). Unstandardized solutions (also referred to as coefficients, paths, or parameter estimates) are those estimates of the linear equation linking two variables. The magnitudes of these paths reflect the resulting change in a dependent variable from a unit change in an independent variable, with all other independent variables being held constant (Preacher & Kelley, 2010). The reasons behind

concentrating on unstandardized coefficient findings rather than standardized coefficient findings for this section are (a) numerous indirect effects were found in this study, (b) indirect effects are interpretable when the sample is used as an estimate of the population; thereby, the original metrics communicate effect and practical importance, and (c) the indirect effect has a straightforward interpretation, which is that the effect of the independent variable on the dependent variable decreases when a mediator(s) is/are added to the model (Baguley, 2009; Ozer, 2007). Use of original metrics are considered directly interpretable (Taylor, MacKinnon, & Tein, 2007) and further discussion of findings will be based on the unstandardized parameters estimates.

In addition, mediation analysis is conducted to test for the presence and significance of indirect paths that may not be apparent if only a causal steps approach to mediation was taken (Preacher & Hayes, 2008). In a causal steps approach, mediation would only occur if the entire path (direct, indirect, or combination) was significant. Other models of mediation analysis advocate that regression based methods, such as the causal steps method, are not as powerful a test as mediational analysis, and that inconsistent mediation (suppression) could occur where there are opposite signs of any combination of direct or indirect effects. Indeed, indirect paths may consist of multiple individual paths each indirect path must be analyzed by examining how each individual path contributes to the total indirect path (Cheung, 2009). In addition, direct and/or indirect paths that cancel out each other (suppress each other) should be examined for individual significant mediation of the indirect paths involved. Mediation analysis was performed by examination of the significance $\geq |1.96|$ of indirect effects' standard errors

and verifying that their constructed confidence intervals did not straddle zero. All research hypotheses were tested at the .05 level of significance.

Findings Organized by Hypothesis

The following findings, organized by hypotheses, are based on the unstandardized solutions (see Figure 6), and are presented in Table 12. No full mediation was found; further references to actual mediation describe partial mediation.

Hypothesis 1

Research hypothesis one was that parents' (mother or father) sexual risk communication would have a direct, negative relationship with adolescents' sexual risk behavior (see Figure 1).

Neither parents' sexual risk communication had a direct and negative relationship with adolescents' sexual risk behavior, as hypothesized. Rather, mother-adolescent sexual risk communication had a direct, positive effect on adolescents' reports of sexual risk behavior; the more adolescents reported that their mothers talked about sexual risk, the more adolescents reported they engaged in sexual risk behavior. In other words, adolescent sexual risk behavior is expected to increase by .27 units (on its 16-point scale) for every 1-unit increase (on its 40-point scale) in mother-adolescent sexual risk communication. No direct effects were found from fathers' sexual risk communication influence on adolescent sexual risk behavior. There were significant indirect effects from both mothers' and fathers' sexual risk communication on adolescents' sexual risk behavior (see Table 12).

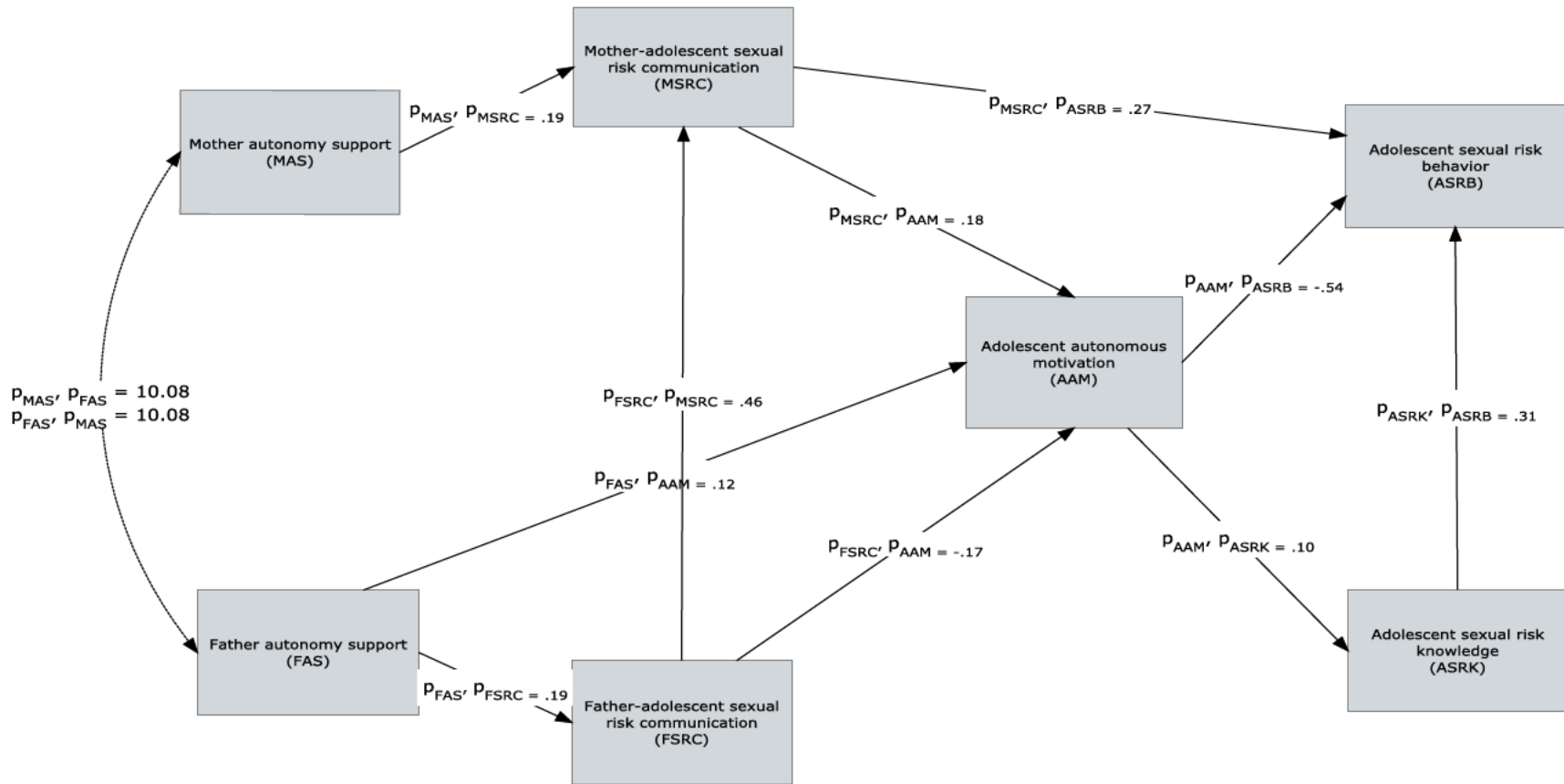


Figure 6. Trimmed Model of Unstandardized Solutions.

Note. All simple paths are direct and significant. p_{MAS} - Path from/to Mother Autonomy Support, p_{MSRC} - Path from/to Mother Sexual Risk Communication, p_{FAS} - Path from/to Father Autonomy Support, p_{FSRC} - Path from/to Father Sexual Risk Communication, p_{AAM} - Path from/to Adolescent Autonomy Motivation, p_{ASRK} - Path from/to Adolescent Sexual Risk Knowledge, p_{ASRB} - Path from/to Adolescent Sexual Risk Behavior

Table 12

Test for Mediation of Indirect Effects on Adolescent Sexual Risk Behavior: Examination of Standard Errors and Confidence Intervals

Independent Variable	Effects	SE	t Value	95% Confidence Interval	
Mother-Adolescent Sexual Risk Communication	Direct (PMSRC, PASRB)	Total Direct = .27	.108*	2.51	
	Indirect (PMSRC, PAAM) x (PAAM, PASRB)	(.18 x -.54) = -.097	.042	- 2.29	[-0.014193, -0.180207]
	(PMSRC, PAAM) x (PAAM, PASRK) x (PASRK, PASRB)	(.18 x .10 x .31) = .006	.004	1.37	[0.014138, -0.002978]
	Total Indirect = -.091	.040	- 2.27		
	Total Direct and Indirect = .18	.11	1.60		
Father-Adolescent Sexual Risk Communication	Direct (PFSRC, PASRB)	Total Direct = None			
	Indirect (PFSRC, PMSRC) x (PMSRC, PASRB)	(.46 x .27) = .124 +	.052	2.40	[0.225627, 0.022773]
	(PFSRC, PMSRC) x (PMSRC, PAAM) x (PAAM, PASRB)	(.46 x .18 x -.54) = -.045 +	.020	- 2.22	[-0.005061, -0.084363]
	(PFSRC, PMSRC) x (PMSRC, PAAM) x (PAAM, PASRK) x (PASRK, PASRB)	(.46 x .18 x .10 x .31) = .003 +	.002	1.48	[0.006551, -0.001417]
	(PFSRC, PAAM) x (PAAM, PASRB)	(-.17 x -.54) = .092 +	.042	2.17	[0.174995, 0.008605]
	(PFSRC, PAAM) x (PAAM, PASRK) x (PASRK, PASRB)	(-.17 x .10 x .31) = -.005 =	.004	- 1.19	[0.002969, -0.013509]
Total Indirect = .1695	.06	2.75			
Total Direct and Indirect = .1695	.06	2.75			
Mother Autonomy Support	Direct (PMAS, PASRB)	Total Direct = None			
	Indirect (PMAS, PMSRC) x (PMSRC, PASRB)	(.19 x .27) = .051 +	.023	2.18	[0.097242, 0.005358]
	(PMAS, PMSRC) x (PMSRC, PAAM) x (PAAM, PASRB)	(.19 x .18 x -.54) = -.018 +	.009	- 1.99	[-0.000739, - 0.036197]
	(PMAS, PMSRC) x (PMSRC, PAAM) x (PAAM, PASRK) x (PASRK, PASRB)	(.19 x .18 x .10 x .31) = .001 =	.001	1.35	[0.002507, -0.000387]
	Total Indirect = .034	.02	1.51		
Total Direct and Indirect = .034	.02	1.51			

Independent Variable	Effects	SE	t Value	95% Confidence Interval	
Father Autonomy Support	Direct (p _{FAS} , p _{ASRB})	Total Direct = None			
	Indirect				
	(p _{FAS} , p _{AAM}) x (p _{AAM} , p _{ASRB})	(.12 x -.54) = -.065 +	.029	- 2.25	[-0.008104, -0.121496]
	(p _{FAS} , p _{AAM}) x (p _{AAM} , p _{ASRK}) x (p _{ASRK} , p _{ASRB})	(.12 x .10 x .31) = .004 +	.003	1.36	[0.009469, -0.002029]
	(p _{FAS} , p _{FSRC}) x (p _{FSRC} , p _{AAM}) x (p _{AAM} , p _{ASRB})	(.19 x -.17 x -.54) = .017 +	.009	1.87	[0.035276, -0.000392]
	(p _{FAS} , p _{FSRC}) x (p _{FSRC} , p _{AAM}) x (p _{AAM} , p _{ASRK}) x (p _{ASRK} , p _{ASRB})	(.19 x -.17 x .10 x .31) = -.001 +	.001	- 1.20	[0.000634, -0.002637]
	(p _{FAS} , p _{FSRC}) x (p _{FSRC} , p _{MSRC}) x (p _{MSRC} , p _{AAM}) x (p _{AAM} , p _{ASRK}) x (p _{ASRK} , p _{ASRB})	(.19 x .46 x .18 x .10 x .31) = .000 +	N/A	N/A	N/A
	(p _{FAS} , p _{FSRC}) x (p _{FSRC} , p _{MSRC}) x (p _{MSRC} , p _{AAM}) x (p _{AAM} , p _{ASRB})	(.19 x .46 x .18 x -.54) = -.008 +	.004	- 1.84	[0.000045, -0.017035]
(p _{FAS} , p _{FSRC}) x (p _{FSRC} , p _{MSRC}) x (p _{MSRC} , p _{ASRB})	(.19 x .46 x .27) = .024 =	.011	2.11	[0.045873, 0.001323]	
	Total Indirect = -.029	.03	- 1.02		
	Total Direct and Indirect = -.029	.03	- 1.02		
Adolescent Autonomy Motivation	Direct (p _{AAM} , p _{ASRB})	Total Direct = -.54			
	Indirect Effect (p _{AAM} , p _{ASRK}) x (p _{ASRK} , p _{ASRB})	(.10 x .31) = .031	.021	1.47	[0.072455, -0.010455]
		Total Indirect = .031			
	Total Direct and Indirect = -.509	.11	- 4.55		
Adolescent Sexual Risk Knowledge	Direct (p _{ASRK} , p _{ASRB})	Total Direct = .31			
	Indirect None	Total Indirect = None			
		Total Direct and Indirect = .31	.153	2.02	

Note. p_{MAS} - Path from/to Mother Autonomy Support, p_{MSRC} - Path from/to Mother Sexual Risk Communication, p_{FAS} - Path from/to Father Autonomy Support, p_{FSRC} - Path from/to Father Sexual Risk Communication, p_{AAM} - Path from/to Adolescent Autonomy Motivation, p_{ASRK} - Path from/to Adolescent Sexual Risk Knowledge, p_{ASRB} - Path from/to Adolescent Sexual Risk Behavior; *Calculated by hand from t-Values (Coefficient/SE = t Value); all other SEs calculated by multivariate delta method (Cheung, 2009) two-Path CIs constructed using 95% Wald method (Taylor et al., 2007) and three- or greater- path SEs calculated using multivariate delta method (Cheung, 2009).

Of two indirect relationships between mother-adolescent sexual risk communication and adolescent sexual risk behavior, only one was significant and in the hypothesized direction, i.e. negative. The more adolescents reported their mothers talked about sexual risk, the less sexual risk behavior was reported by adolescents. Indeed, adolescent sexual risk behavior is expected to decrease by .097 units (on its 16-point scale) for every 1-unit increase (on its 40-point scale) in mother-adolescent sexual risk communication when the only indirect influence was adolescent autonomous motivation.

Of five indirect relationships between father-adolescent sexual risk communication and adolescent sexual risk behavior, only three were significant. Two effects were contrary to the hypothesized direction and indicated that the more adolescents reported their fathers talked about sexual risk, the more adolescents reported sexual risk behavior. Statistically, adolescent sexual risk behavior was expected to increase by .124 units (on its 16-point scale) for every 1-unit increase (on its 40-point scale) in father-adolescent sexual risk communication, when the only indirect influence was mother-adolescent sexual risk communication. When adolescent autonomous motivation was the only indirect influence between father-adolescent sexual risk communication and adolescent sexual risk behavior, adolescent sexual risk behavior was expected to increase by .092 units (on its 16-point scale) for every 1-unit increase (on its 40-point scale) in father-adolescent sexual risk communication.

In contrast, the third indirect effect indicated that the more adolescents reported their fathers talked about sexual risk, the less adolescents reported sexual risk behavior. Adolescent sexual risk behavior was expected to decrease by .045 units (on its 16-point scale) for every 1-unit increase (on its 40-point scale) in father-adolescent sexual risk

communication when the only indirect influences were mother-adolescent sexual risk communication and adolescent autonomous motivation.

When considered together, the direct and indirect effects of mother-adolescent sexual risk communication on adolescent sexual risk behavior would appear to cancel each other out; the total effects would no longer be significant. However, separately, the direct and indirect effects (one direct significant path and two indirect significant paths) of mother-adolescent sexual risk communication on adolescent sexual risk behavior represent unique relationships.

The combined indirect effects of father-adolescent sexual risk communication on adolescent sexual risk behavior indicates suppression as well, with two positive significant indirect paths and one negative significant path. Overall, the total indirect paths were significant. However, indirect effects were not hypothesized.

Hypothesis 1 was not supported.

Hypothesis 2

Hypothesis two was that parents' (mother or father) sexual risk communication would have a positive relationship with adolescents' sexual risk knowledge (see Figure 1).

Contrary to the hypothesis, neither mother- nor father-adolescent sexual risk communication had a direct relationship with adolescents' knowledge of sexual risk (see Figure 6, Trimmed model – Unstandardized Solutions). While both mother- and father-adolescent sexual risk communications had indirect relationships with adolescent sexual risk knowledge when adolescent autonomous motivation was mediating the relationship,

there were no significant mediated effects (see Table 13).

Hypothesis 2 was not supported.

Hypothesis 3

Hypothesis 3 was that parents' (mother or father) support of autonomy would have a negative relationship with adolescents' sexual risk behavior (see Figure 1).

Contrary to the hypothesis, neither mothers' nor fathers' autonomy support had a direct relationship with adolescents' sexual risk behavior. However, there were significant indirect effects from both mothers' and fathers' support of autonomy on adolescents' sexual risk behavior (see Table 12).

Of three indirect relationships between mother-adolescent autonomy support and adolescent sexual risk behavior, only two were significant when examining the indirect effects' standard errors and confidence intervals. Adolescent sexual risk behavior was expected to increase by .051 units (on its 16-point scale) for every 1-unit increase (on its 63-point scale) in mother-adolescent autonomy support when the only indirect influence was mother-adolescent sexual risk communication. In contrast, adolescent sexual risk behavior was expected to decrease by .018 units (on its 16-point scale) for every 1-unit increase (on its 63-point scale) in mother-adolescent autonomy support when the only indirect influences were mother-adolescent sexual risk communication and adolescent autonomous motivation.

Of the seven indirect relationships between father-adolescent autonomy support and adolescent sexual risk behavior, only two were significant using mediation

Table 13

Test for Mediation of Indirect Effects on Adolescent Sexual Risk Knowledge: Examination of Standard Errors and Confidence Intervals

Independent Variable	Effects	SE	t Value	95% Confidence Interval
Mother-Adolescent Sexual Risk Communication	Direct (P_{MSRC}, P_{ASRK}) Total Direct = None Indirect $(P_{MSRC}, P_{AAM}) \times (P_{AAM}, P_{ASRK})$ $(.18 \times .10) = .018$ Total Indirect = .018 Total Direct and Indirect = .02	.011 .011 .01	1.65 1.65 1.65	[0.039379, -0.003379]
Father-Adolescent Sexual Risk Communication	Direct (P_{FSRC}, P_{ASRK}) Total Direct = None Indirect $(P_{FSRC}, P_{AAM}) \times (P_{AAM}, P_{ASRK})$ $(-.17 \times .10) = -.017$ Total Indirect = -.017 Total Direct and Indirect = .02	.011 .011 .01	-1.60 -1.60 -1.60	[0.003839, -0.037839]
Mother Autonomy Support	Direct (P_{MAS}, P_{ASRK}) Total Direct = None Indirect $(P_{MAS}, P_{MSRC}) \times (P_{MSRC}, P_{AAM}) \times (P_{AAM}, P_{ASRB})$ $(.19 \times .18 \times .10) = -.003$ Total Indirect = .003 Total Direct and Indirect = .003	.002 .002 .002	1.36 1.36 1.36	[0.007750, -0.000910]
Father Autonomy Support	Direct (P_{FAS}, P_{ASRK}) Total Direct = None Indirect (P_{AAM}, P_{ASRB}) $(.12 \times .10) = .012 +$ $(P_{FAS}, P_{FSRC}) \times (P_{FSRC}, P_{AAM}) \times (P_{AAM}, P_{ASRK})$ $(.19 \times -.17 \times .10) = -.003 +$.007 .002	1.63 1.39	[0.026435, -0.002435] [0.001015, -0.007475]

Independent Variable	Effects	SE	<i>t</i> Value	95% Confidence Interval
	Total Indirect = .009	.01	1.54	
	Total Direct and Indirect = .01	.01	1.54	
Adolescent Autonomy Motivation	Direct (p_{AAM} , p_{ASRK})			
	Total Direct = .10	.05*	2.13	
	Indirect			
	Total Indirect = None			
	Total Direct and Indirect = .10	.05*	2.13	

Note. p_{MAS} - Path from/to Mother Autonomy Support, p_{MSRC} - Path from/to Mother Sexual Risk Communication, p_{FAS} - Path from/to Father Autonomy Support, p_{FSRC} - Path from/to Father Sexual Risk Communication, p_{AAM} - Path from/to Adolescent Autonomy Motivation, p_{ASRK} - Path from/to Adolescent Sexual Risk Knowledge, p_{ASRB} - Path from/to Adolescent Sexual Risk Behavior; *Calculated by hand from *t*-Values (Coefficient/SE = *t* Value); all other SEs calculated by multivariate delta method (Cheung, 2009), two-Path CIs constructed using 95% Wald method (Taylor et al., 2007) and three- or greater- path SEs calculated using multivariate delta method (Preacher & Kelley, 2010).

analysis. Adolescent sexual risk behavior was expected to decrease by .065 units (on its 16-point scale) for every 1- unit increase (on its 63-point scale) in father-adolescent autonomy support when the only influence was adolescent autonomous motivation. In contrast, adolescent sexual risk behavior was expected to increase by .024 units (on its 16-point scale) for every 1-unit increase (on its 63-point scale) in father-adolescent autonomy support when the only influences were father-adolescent sexual risk communication and mother-adolescent sexual risk communication.

There were two significant indirect effects for the influences of each parent's autonomy support; each parent's autonomy support had a positive and negative effect indicating a suppression action (see Table 12). Although the sum of all indirect paths for each parent's autonomy support was not significant, the presence of individual indirect effects that were significant indicated that there were mediational effects present working in ways that would appear to be opposite. Specifically, mother autonomy support through a multi-mediational path involving its sexual risk communication and adolescent autonomous motivation, resulted in an effect in the hypothesized direction (a negative impact on adolescent sexual risk behavior). In addition, father autonomy support through adolescent autonomous motivation also resulted in an effect in the hypothesized direction. The opposite is true when mother autonomy support was mediated through its respective sexual risk communication without adolescent autonomy support. Father autonomy support had a similar positive indirect effect when multimediated by father-adolescent sexual risk communication and mother-adolescent sexual risk communication.

In spite of several indirect significant paths, there were no direct relationships between parental autonomy support and adolescent sexual risk behavior.

Hypothesis 3 was not supported.

Hypothesis 4

Hypothesis 4 was that parents' (mother or father) support of autonomy would have a positive relationship with adolescents' sexual risk knowledge (see Figure 1).

Contrary to the hypothesized relationship, neither parents' support of autonomy had a direct relationship with adolescents' sexual risk knowledge. Of five indirect paths from mother- and father- autonomy support to sexual risk behavior, none were significant (see Table 13).

Hypothesis 4 was not supported.

Hypothesis 5

Hypothesis 5 was that parents' (mother or father) autonomy support would have a positive relationship with parents' (mother- or father-adolescent) sexual risk communication (see Figure 1).

As hypothesized, the more mother or father autonomy support that was reported by their adolescents, the greater amounts of mother-adolescent or father-adolescent sexual risk communication that were reported by the adolescents. Mother-adolescent or father-adolescent sexual risk communication was expected to increase by .19 units (on its 40-point scale) for every 1-unit increase (on its 63-point scale) in parent-adolescent autonomy support.

In summary, both parents' (mother and father) autonomy support was directly associated with parents' (mother- or father-adolescent) sexual risk communication in the

hypothesized positive direction.

Hypothesis 5 was supported.

Hypothesis 6

Hypothesis 6 was that adolescents' autonomous motivation would mediate the proposed negative relationship between parents' (mother- or father-adolescent) sexual risk communication and adolescents' sexual risk behavior (see Figure 1).

Autonomous motivation did negatively mediate the relationship between each of mother-adolescent and father-adolescent sexual risk communication and adolescents' sexual risk behavior (see Table 12). The greater amounts of mother or father communication about sexual risk, reported by adolescents, the less sexual risk behavior was reported when influenced by adolescents' autonomous motivation. Adolescents' sexual risk behavior was expected to decrease by .54 units (on its 16-point scale) for every 1-unit increase (on its 42-point scale) in adolescent autonomous motivation.

Hypothesis 6 was supported.

Hypothesis 7

Hypothesis 7 was that adolescents' autonomous motivation would mediate the proposed positive relationship between parents' (mother- or father-adolescent) sexual risk communication and adolescents' sexual risk knowledge (see Figure 1).

As hypothesized, adolescents' autonomous motivation did positively mediate the relationship between each of mother-adolescent and father-adolescent sexual risk

communication and adolescents' sexual risk knowledge (see Table 13); when adolescents reported more mother- or father-adolescent sexual risk communication, they also reported more sexual risk knowledge when that relationship was influenced by adolescents' autonomous motivation. Adolescent sexual risk knowledge was expected to increase by .10 units (on its 27-point scale) for every 1-unit increase (on its 42-point scale) in adolescent autonomous motivation.

Hypothesis 7 was supported.

Hypothesis 8

Hypothesis 8 was that adolescents' autonomous motivation would mediate the proposed negative relationship between parents' (mother or father) autonomy support and adolescents' sexual risk behavior (see Figure 1).

As hypothesized, adolescents' autonomous motivation did negatively mediate the relationship between each of mother and father's autonomy support and adolescents' sexual risk behavior (see Table 12). When adolescents reported more mother or father autonomy support, they also reported less sexual risk behavior when that relationship was influenced by adolescents' autonomous motivation. Adolescents' sexual risk behavior was expected to decrease by .54 units (on its 16-point scale) for every 1-unit increase (on its 42-point scale) in adolescent autonomous motivation.

Hypothesis 8 was supported.

Hypothesis 9

Hypothesis 9 was that adolescents' autonomous motivation would mediate the

proposed positive relationship between parents' (mother or father) autonomy support and adolescents' sexual risk knowledge (see Figure 1).

As hypothesized, adolescents' autonomous motivation did mediate the relationship between parents' (mother or father) autonomy support and adolescents' sexual risk knowledge (see Table 13). When adolescents reported more mother or father autonomy support, adolescents also reported more sexual risk knowledge when that relationship was influenced by adolescents' autonomous motivation. Adolescent sexual risk knowledge was expected to increase by .10 units (on its 27-point scale) for every 1-unit increase (on its 42-point scale) in adolescent autonomous motivation.

Hypothesis 9 was supported.

Hypothesis 10

Hypothesis 10 was that adolescents' sexual risk knowledge would have a negative relationship with adolescents' sexual risk behavior (see Figure 1).

Contrary to the hypothesized relationship, adolescents' sexual risk knowledge was positively related to adolescents' sexual risk behavior; when adolescents reported greater sexual risk knowledge, they also reported greater sexual risk behavior. Adolescent sexual risk behavior was expected to increase by .31 units (on its 16-point scale) for every 1-unit increase (on its 27-point scale) in adolescent sexual risk knowledge.

Hypothesis 10 was not supported.

Additional Findings

While not originally proposed in the conceptual model, father-adolescent sexual

risk communication had a significant, direct, positive, relationship with mother-adolescent sexual risk communication. This modification was included in the baseline and subsequent models.

Summary

In summary, the final trimmed model showed that parental influences of sexual risk communication and autonomy support, directly and indirectly predicted adolescents' autonomous motivation, sexual risk behavior (standardized coefficient = $-.30$) and sexual risk knowledge (standardized coefficient = $.13$). The trimmed model explained 11% of variance in adolescents' sexual risk behavior and 1.8% of variance in adolescents' sexual risk knowledge.

Indirect effect analysis was completed using unstandardized coefficients. Many paths were indirect and some were suppressed. As a corroboration of effects based on the unstandardized coefficients, the variances were, in addition, examined as an effect measure.

Small variances in psychosocial research are quite common and due to high levels of measurement error from the great number of variables and the randomness that affects human behavior; multiple coefficient of determination values greater than $.50$ are seldom seen. Furthermore, correlation coefficient values of $.1$ or $.2$ are standard in analyses of family data (Greenstein, 2006). The differences in an effect size quantitatively and the practical importance of effects are discussed in the following chapter.

CHAPTER 5

DISCUSSION

The purpose of this exploratory study was to assess a model of the influences of parent-adolescent sexual risk communication and parental autonomy support on late adolescents' sexual risk behavior and sexual risk knowledge and the mediation of these parental influences by adolescents' autonomous motivation. The sample included 249, 19- and 20-year-old college students from an urban 4-year college in the state of Alabama. The instruments used in this study were the Parent-Teen Sexual Risk Communication Scale-III (PTSRC-III) (Hutchinson, 2007), the college-student version of the Perceptions of Parents Scales (POPs) (Robbins, 1994), the Treatment of Self-Regulation Questionnaire (TSRQ) (Ryan & Connell, 1989; Williams et al., 1996), the STD-Knowledge Questionnaire (STD-KQ) (Jaworski & Carey, 2007), and the Adolescent Risk Inventory (ARI) Sex Risk sub-scale (Lescano et al., 2007). The supporting theoretical framework for this study was self-determination theory (SDT) (Deci & Ryan, 1985b; Ryan, Deci et al., 1995). SPSS Version 14 was used to generate univariate and multivariate statistics and the Lisrel Version 8.80 was used to generate path analysis statistics. This chapter includes a discussion of the sample and measures.

Sample

The sample size of 249 was adequately powered for testing of hypotheses. Power was calculated based on recommendations that a minimum of 5 cases per parameter should be obtained (Bollen, 1989). With 31 parameters in this study, a minimum of 5 cases per parameter would be 155 cases, which was exceeded.

The sample was representative in several aspects. Participants were from ethnically diverse populations and their ethnic and gender representations were representative of national college enrollment statistics (Knapp, Kelly-Reid, & Ginder, 2011). In addition, participants' sexual activity was comparable to national reports (CDC, 2009b). Furthermore, parental marital status was reflective of national marriage statistics (Goodwin, Mosher, & Chandra, 2010) and parents' educational status was reflective of adolescent's college enrollment (Eccles & Davis-Kean, 2005).

This sample was representative of a national sample of public college undergraduates enrolled in 2009. This sample was primarily Caucasian (60%), which is consistent with the national sample's Caucasian enrollment (62%) (Knapp et al., 2011). Enrollment of African-Americans (23%) and Asian/Native Hawaiians or Pacific Islanders (12%) in this study was greater than the national college undergraduate enrollment of African-Americans (12%) and Asian/Native Hawaiians or Pacific Islanders (7%). However, there were fewer African-Americans enrolled in this study (23%) than African-Americans who were enrolled in the state of Alabama's colleges (29%) in 2007 (U.S., 2007). There were fewer Hispanics/Latinos in this sample (2%) than in the national sample (11%).

This sample had more females (61%) than males as compared to a female enrollment of 54% in the 2009 national sample (Knapp et al., 2011). While males were somewhat underrepresented in the present study, relative to a 50-50 gender split, this sample is consistent with other findings that the gap in college enrollment favoring females is greater in U.S. southern states (Mather & Adams, 2007). Southern females were enrolled at a ratio of 1.4, an enrollment of 58 females for every 42 males. In

addition, 70% of the participants in this sample were sexually active, which is comparable with the national report of 70.6% of 18- to 19-year-olds being sexually active and 86.6% of 20- to 24-year-olds being sexually active (CDC, 2009b).

The majority of participants (66%) reported that their parents were married and living together at the time of the study. This sample's parental marriage rate of 66% (mean age = 48 years for mothers, mean age = 50 years for fathers) is comparable to the CDC's 2002 national marriage rates for 40- to 44-year-olds of 67%. (Goodwin et al., 2010). In addition, 41% of this sample's adolescents lived with their parents; other living arrangements were not assessed.

Adolescents in this study reported the majority of their parents had attained a high-school education. The modal response ($n = 96$) for mothers' highest educational level was "college graduate" and the modal response ($n = 77$) for fathers' highest educational level was "one year of college or specialized training". Parental education has been found to predict greater education of children (Eccles & Davis-Kean, 2005). This sample appears to represent primarily non-first generation college enrollees.

In conclusion, this sample was reflective of college students in a 4-year public university setting in the southeastern U.S; the students in this study were mainly female, Caucasian, sexually active, and had biological parents who were both living, had attended college, and whose marital status was similar to the national marriage rates. In addition, similar to other studies about parental sexual communication (Clawson & Reese-Weber, 2003; DiIorio, Dudley et al., 2000; Lehr et al., 2000), the college students were mostly female, Caucasian, and sexually active.

Assessment of Measures

Parent-adolescent sexual risk communication was evaluated using the Parent-Teen Sexual Risk Communication Scale-III (PTSRC-III) (Hutchinson, 2007). Parent-teen sexual risk communication scores between 23 and 16 are considered moderate and scores below 16 are considered low (Hutchinson & Cooney, 1998). The college students in this study indicated lower amounts of father-adolescent sexual risk communication, mean score of 16 (range = 8 – 40), than mother-adolescent sexual risk communication, mean score of 22 (range = 8 – 40). In addition, a portion of college students in this study indicated that their fathers (37%) or mothers (5%) had no sexual risk communication with them. Furthermore, 2% of the participants reported that neither their mothers nor fathers had communicated with them about sexual risk.

The PTSRC-III was reliable when administered to these late adolescent college students. The internal consistency reliabilities for adolescents' reports of father-adolescent and mother-adolescent sexual risk communication were high (.93 for mothers and .94 for fathers), and were equal to or better than reliabilities in the original psychometric study (.93 for mothers and .88 for fathers) (Hutchinson, 2007). Hutchinson's sample consisted of male and female late adolescent college students selected from the general population of college students. However, in contrast to this study's enrollment of 39% males, Hutchinson's (2007) sample included 10% males.

The influence of parental autonomy support was assessed with the college-student version of the Perceptions of Parents Scales (POPs) (Robbins, 1994). Both mothers' autonomy support and fathers' autonomy support had a mean score of 45 (ranges = 9 – 63), which indicates these late adolescent college students perceived a moderately high

level of parental autonomy support. The internal consistency reliability for this measure was good for the late adolescents' reports about mothers (.88) and fathers (.86), and better than reliabilities (.79 for mothers and .77 for fathers) originally reported by Robbins (1994). Robbins' sample consisted of male and female college students.

Adolescents' autonomous motivation was measured using an investigator-adaptation of the Treatment of Self-Regulation Questionnaire (TSRQ) (Ryan & Connell, 1989; Williams et al., 1996). The authors recommended that this scale be adapted as needed to study other behaviors. The TSRQ has been previously used to assess motivation to change unhealthy behavior (Williams et al., 1999). The mean score of 21 in this study is moderately high considering the potential range of scores (6 - 42), which were fully encompassed in this study. The internal consistency reliability was good (.88), and was comparable to the pre-intervention reliabilities (.89 for males and .88 for females) reported in a tobacco cessation intervention provided to high school students (Williams et al., 1999). In another study of 9th through 12th graders (Williams et al., 2000), the Cronbach's alpha was .91.

Assessment of adolescents' sexual risk knowledge was completed using the STD-Knowledge Questionnaire (STD-KQ) (Jaworski & Carey, 2007). The mean score of 15 (range = 0 - 27) in this study was the same as a pre-intervention score of 15 reported in Jaworski's and Carey's (2007) psychometric study. The internal consistency reliability in this study was good (.85) and was consistent with Jaworski's and Carey's report of .86. The sample in Jaworski's and Carey's study consisted of middle and late adolescents from an undergraduate population. The mean age was 27 years.

Adolescents' sexual risk behavior was evaluated with the Adolescent Risk

Inventory (ARI) Sex Risk sub-scale (Lescano et al., 2007). The mean score in this study (10) was comparable to the mean score of 11 in Lescano et al.'s study of 12- to 19-year-olds undergoing psychiatric treatment. The mean score of 10 (range = 7 - 16) is considered indicative of sexual risk. The internal consistency reliability in this study was acceptable and was the same as the internal consistency reliability (.72) in the original report about the scale (Lescano et al., 2007).

In summary, all of the measures employed in the analyses demonstrated good internal consistency reliability when administered to this sample of unmarried, 19- or 20-year-old college students currently attending a 4- year public university in the southeastern U.S.

Findings Regarding the Model

The model and modeling process was complex. All of the original variables were retained in the model; however, some hypothesized paths between variables were eliminated, some paths' directions changed, and a path was added due to a modification in the model. Furthermore, some paths were eliminated based on the mediation analyses.

In the final model, when mothers and fathers provided greater amounts of autonomy support, they also provided more sexual risk communication. In a similar manner, when mothers and fathers independently provided greater amounts of both autonomy support and sexual risk communication, adolescents reported increases in their autonomous motivation. Adolescent autonomous motivation was a key variable in this model and it was associated with adolescents' reports of reductions in their sexual risk behaviors. However, adolescent autonomous motivation only partially mediated the

relationship between parental influences (i.e., mother autonomy support, father autonomy support, mother-adolescent sexual risk communication, and father-adolescent sexual risk communication) and adolescent outcomes (i.e., sexual risk behavior and sexual risk knowledge). Two indirect paths, the first from mother autonomy support through mother-adolescent sexual risk communication, and the second from father autonomy support through father-adolescent sexual risk communication and through mother-adolescent sexual risk communication, were associated with increases in adolescents' sexual risk behavior. After mediation analyses, some indirect paths from mother autonomy support or father autonomy support to adolescents' sexual risk behavior were eliminated, as were all indirect paths leading to adolescents' sexual risk knowledge, due to loss of statistical significance.

Parental Influences

Autonomy Support to Sexual Risk Communication

Mothers' and fathers' autonomy supportive parenting predicted increases in their own sexual risk communication to their adolescents (Hypothesis 5). Autonomy support as measured in this study can be considered an indicator of a general relationship quality. Similarly, others have found associations between quality of parent-adolescent relationships with occurrence (DiIorio, Dudley et al., 2000) and amount (Hutchinson, 2002) of parent-adolescent sexual risk communication. Better quality of a parent-adolescent relationship seems to relate to occurrence, as well as greater amounts of parent-adolescent sexual risk communication.

Self-determination theory (SDT) indicates that autonomy support involves the use

of techniques that facilitate choice and independent problem solving (Grolnick et al., 1991), and does not include dictation of outcomes; it results in an appreciation of the adolescents' perspective and provision of information in a participatory manner (Grolnick & Ryan, 1989). Autonomy supportive parents may be more tuned into their adolescents resulting in more awareness of what is important to the adolescents, such as, during late adolescence, picking up on the cues that their adolescents are considering or are involved in sexual relationships and want to communicate more about sexual risk. In addition, the late adolescent may feel free to request more information about sex from their parents who are more autonomy supportive, thereby, creating an atmosphere for mutual communication of sexual risk.

This study's findings also indicated that when fathers were more autonomy supportive they communicated to their adolescents more about sexual risk and they contributed to mothers also communicating more to their adolescent about sexual risk. This finding was not hypothesized, but was added after review of modification indices and confirmation that theory supported the added relationship. This positive relationship leading from father-adolescent sexual risk communication to mother-adolescent sexual risk communication is noteworthy. It contrasts to previous findings that mothers were more prominent in sexual risk communication than fathers were, and that fathers supported sexual risk communication, but did little of the communication themselves (Kirkman, Rosenthal, & Feldman, 2002). Fathers communication may become more important during the time of late adolescence as fathers' roles grow from modeling relationships of the outside world (Youniss & Smollar, 1985), e.g., sexual risk, by providing inputs, e.g., adolescent sexual risk communication. Fathers' greater

participation appears to influence mothers' involvement in adolescent-sexual risk communication in the same direction. According to systems theory, mothers' and fathers' roles are interwoven to the extent that parents are simultaneously interacting with their adolescent (Bell & Bell, 1983).

The relationship of father-adolescent sexual risk communication to mother-adolescent sexual risk communication examined and found significant in this study was not examined in two other studies of quality of parent communication and parent-adolescent sexual risk communication (DiIorio, Dudley et al., 2000; Hutchinson, 2002). In one of these studies (DiIorio, Dudley et al., 2000), there was combined, rather than separate, assessment of both parents' quality of communication and both parents' adolescent sexual risk communication. Because of this collective assessment, father quality of communication and father-adolescent sexual risk communication could not be distinguished from mother quality of communication and mother-adolescent sexual risk communication, respectively. In the second study (Hutchinson, 2002), the sample was all female, compared to this study where males and females were included. This single gender sample probably minimized fathers' roles in sexual risk communication because fathers have typically had less amounts of sexual risk communication with their daughters than with their sons (DiIorio et al., 1999; Dutra, Miller, & Forehand, 1999; Hutchinson & Cooney, 1998). Indeed, Hutchinson (2002) only found significance for the relationship between mother-daughter quality of communication and mother-adolescent sexual risk communication; all father-adolescent variables were dropped for non-significance and were eliminated from her model. Although, both the DiIorio, Dudley et al. (2002), and the Hutchinson studies used an advanced statistical modeling technique

similar to this study, lack of measurement of mothers' and fathers' variables separately (DiIorio, Dudley et al., 2000), and the use of only one gender in the sample (Hutchinson, 2002), did not allow the detection of a relationship between father-adolescent sexual risk communication and mother-adolescent sexual risk communication, as was found in this study.

Overall, these findings about parental autonomy support and parent-adolescent sexual risk communication indicated a need to further our understanding of fathers' and mothers' sexual risk communication, especially the quality and autonomy supportiveness in that communication. The amount of communication was evaluated in this study. A higher amount of communication does not necessarily indicate that the process or content of sexual risk communication was of better quality. Therefore, questions remain about how a general autonomy support style translates to sexual risk communication and whether the sexual risk communication includes indications of quality, such as, autonomy support, content and its accuracy, and trustworthiness and openness of the source of sexual risk communication.

Paths Mediated by Adolescent Autonomous Motivation

As noted previously, both mother and father autonomy support predicted greater amounts of their respective sexual risk communication. Furthermore, each parent's greater sexual risk communication (father-adolescent sexual risk communication through mother-adolescent sexual risk communication) predicted greater autonomous motivation in the adolescent. In addition, father autonomy support predicted another relationship. Fathers' autonomy support directly predicted adolescents' valuing the avoidance of

sexual risk (adolescents' autonomous motivation). When mediated by adolescents' autonomous motivation, the parental influences predicted lesser amounts of adolescent sexual risk behavior (Hypotheses 6 and 8), but did not predict significant adolescent sexual risk knowledge (Hypotheses 7 and 9). Furthermore, greater mothers' and fathers' autonomy support predicted less adolescent sexual risk behavior through mediation by their own sexual risk communications and adolescent autonomous motivation.

Autonomous motivation is demonstrated when one performs a behavior because it is personally valued and one feels confident in achieving healthy outcomes from the chosen behavior (Ryan & Deci, 2000b). Autonomous motivation influences healthy behavior because the adolescent is pursuing intrinsic life goals (e.g., personal growth, meaningful relationships, physical fitness) instead of extrinsic life goals (e.g., fame, image) and pursuit of intrinsic life goals allows for more direct satisfaction of the basic psychological needs of autonomy, relatedness, and competence (Kasser & Ryan, 1996). Satisfaction of these three basic needs allows an individual to experience a strong autonomous orientation (Deci & Ryan, 2000, 2008; Deci & Vansteenkiste, 2004). Adolescent autonomous motivation is believed to be enhanced by support for autonomy when communicated by significant persons, such as parents (Ryan et al., 2006). Furthermore, autonomy support from parents was found to predict autonomy in the late adolescent (Ratelle et al., 2005).

In two previous studies (Williams et al., 2000; Wong, 2008) parents' autonomy support was related to increased adolescent healthy behavior involving mediators that indicated autonomy. Williams et al., (2000) found that parents' autonomy support was predictive of less sexual intercourse, while Wong (2008) found that greater parental

autonomy support was the beginning of a mediational chain that predicted less adolescent substance abuse through less disrupted behavior in a classroom when mediated by identified regulation (behavior engaged because it is personally valued). Similarly, Williams et al., (2000) found a mediational chain initiated with parental autonomy support that predicted less extrinsic aspirations that in turn predicted greater sexual intercourse. Parents' autonomy support seems to relate to lesser amounts of adolescent risk behaviors including occurrence of sexual intercourse. Parents' autonomy support also seems to relate to lesser amounts of extrinsic aspirations.

In this study, autonomous motivation was related to not engaging in a sexual risk behavior. The relationship found in this study was that greater mother autonomy support, through her respective greater adolescent sexual risk communication and greater father autonomy support through his respective greater adolescent sexual risk communication and through greater mother-adolescent sexual risk communication, was related to greater reports by adolescents of their autonomous motivation to not engage in sexual risk behavior (Hypotheses 6 and 8). However, no relationship was found between any parental influence and amount of sexual risk knowledge (Hypotheses 2 and 7). Therefore, this study extended research on autonomous motivation as a mediator, specifically, between parents' autonomy support and adolescents' sexual risk behavior. Only one previous study of autonomous motivation (Williams et al., 2000) used the occurrence of sexual intercourse as a outcome. In the present study, a multi-item measure was used to examine sexual risk behavior. In addition, autonomy was assessed by measuring the adolescent's autonomous motivation specifically oriented to avoidance of sexual risk. Previous studies indicated that motivations by adults to self-regulate

behavior were associated with prolonged attendance and involvement in addiction programs (Ryan, Plant et al., 1995) and long term maintenance of weight loss in obese individuals (Williams et al., 1996). Thus, autonomous motivation is a positive factor in engagement with treatment and maintaining health, and, when studied longitudinally, enduring health behavior among adults. Research about similar motivations to reduce risk behaviors among adolescents has also been conducted, but these have centered on motivations to use less alcohol (Neighbors et al., 2003) and motivations to abstain from smoking cigarettes (Williams et al., 1999). Only one of these studies, Neighbors et al. (2003), included late adolescents. This study extends the application of self-determination theory through findings about autonomous motivation of late adolescents to not engage in sexual risk behavior.

Fathers' autonomy support directly predicted adolescents' autonomous motivation to avoid sexual risk and predicted lesser amounts of adolescents' sexual risk behavior, but, contrary to Hypothesis 6, mothers' autonomy support did not. There are several possible explanations for this. First, fathers may make direct and important contributions to the late adolescents' motivations to be autonomous. For example, Allen et al. (1994) found that fathers' behaviors were important in predicting late adolescents' development and self-esteem. In addition, researchers have suggested that fathers take on more importance to their adolescent when fathers share the world outside the family and provide new inputs about that world (Youniss & Smollar, 1985) and have found that fathers were more involved than mothers in guiding their off-springs' relationships in the outer world (i.e., job search) (Soenens & Vansteenkiste, 2005). Lastly, fathers were found to be as important as mothers in supporting the development of their children's'

psychological health, and reducing ill-being (negative affect and depressive symptoms) (Niemiec et al., 2006). Niemiec et al. (2006) also found differences in mothers' and fathers' contributions; when mothers provided greater amounts of autonomy support middle adolescents reported greater well-being. Mothers were more influential in the area of the adolescents' well-being. In this study, sexual risk behavior, a more worldly concept and one associated more often with ill-being (e.g., sexually transmitted disease), than with well-being, was found to be influenced by fathers' autonomy support when mediated by adolescents' autonomous motivation. Moreover, fathers' autonomy support had a direct influence on adolescents' autonomous motivation. Mothers' autonomy support did not similarly directly affect adolescents' autonomous motivation. Other researchers have found that fathers are more involved with their adolescents during this stage of their development as late adolescents (Grolnick, Weiss, McKenzie, & Wightman, 1996) are involved with the world outside the family (college, living away from home or spending more time away from home, spending more time with academics, friends, and interests). Consequently, fathers' autonomy support behaviors may have a more direct bearing on adolescent autonomous motivation to avoid sexual risk than mothers' influences during this stage of development. In contrast, mothers inputs may be more consistent throughout their off-spring's development (Allen et al., 1994); mothers are more involved in guiding their children's relationships in the inner world or more direct social environment (i.e., friendships, and school) (Soenens & Vansteenkiste, 2005). Therefore, mothers' autonomy support behaviors may have less direct influence on the adolescent's autonomous motivation at this time. These contrasting findings between fathers' and mothers' autonomy support endorse measurement of parental influences

separately, as each contributes uniquely to adolescents' autonomy development.

Paths Not Mediated by Adolescents' Autonomous Motivation

Two paths were not mediated by adolescent autonomous motivation. The first path was from mother autonomy support to adolescent sexual risk behavior mediated by mother-adolescent sexual risk communication. The second path was from father autonomy support to adolescent sexual risk communication mediated by father-adolescent sexual risk communication and mother-adolescent sexual risk communication. Both of these paths predicted increases in adolescent sexual risk behavior, contrary to hypothesized relationships (Hypotheses 1 and 3). In other words, outside the influence of adolescent autonomous motivation, the more mothers and fathers provided autonomy support and communicated about sexual risk, the more adolescents reported sexual risk behavior.

Other investigators also found that the amount of mother-adolescent and father-adolescent sexual risk communications was associated with both positive and negative outcomes related to adolescents' sexual risk behaviors (Hutchinson, 1999; Hutchinson et al., 2003; Hutchinson & Montgomery, 2007). Each parents' adolescent-sexual risk communications were associated with greater and lower amounts of adolescents' sexual risk behaviors. Differences in the aspects of adolescent communication assessed and measurements of communication may account for the mixed findings among these studies. For example, assessments of amount of parent-adolescent sexual risk communication have been associated with greater levels of adolescent sexual risk behavior (Clawson & Reese-Weber, 2003; Hutchinson, 1999; Hutchinson et al., 2003;

Hutchinson & Montgomery, 2007), while assessments of parental quality of general communication (DiIorio, Dudley et al., 2000; Hutchinson, 2002) have been associated with lower levels of adolescents' sexual risk behavior. In a more recent longitudinal study (Deptula, Henry, & Schoeny, 2010), involving 12,634 young adults, researchers also found that higher parent-adolescent relationship quality was associated with lower levels of adolescent sexual risk behavior, and that greater amounts of parent-adolescent sexual risk communications were associated with greater adolescent sexual risk behavior. Findings about amount of sexual risk communication in this study indicate that increased amount of parent-adolescent sexual risk communication can lead to positive or negative outcomes, depending on the influences of parents on adolescent autonomous motivation. Measuring aspects such as quality, that were not included in the development of the parent-adolescent sexual risk communication measure used in this study, might provide information about additional variance in adolescents' sexual risk behavior explained by this model.

Partial mediation by adolescents' autonomous motivation was expected because the level of parental autonomy support assessed in this study reflected a general variable, in contrast to the sexual risk specificity of measures of the variables of parent-adolescent communication, adolescent autonomous motivation, and adolescent behavior and knowledge. Had all variables mediated by adolescent autonomous motivation been general or specific a fuller mediation may have occurred in this model (Vallerand, 1997).

Adolescent Outcomes of Sexual Risk Behavior and Sexual Risk Knowledge

Contrary to hypotheses, there were no direct, negative relationships between the

parental influences (mother autonomy support, father autonomy support, mother-adolescent sexual risk communication, father-adolescent sexual risk communication) and the adolescent outcomes of sexual risk behavior (Hypotheses 1 and 3) and sexual risk knowledge (Hypotheses 2 and 4). Although one of these parental influences (mother-adolescent sexual risk communication) demonstrated a direct relationship with an adolescent's sexual risk behavior, the relationship was in a positive direction (opposite of the hypothesized direction). However, two indirect paths were in the hypothesized direction. Two of the four indirect relationships hypothesized (Hypotheses 6 and 8) from the parental influences to adolescent sexual risk behavior were significant in the final model. These indirect paths reflected positive relationships between parental influences and adolescents' autonomous motivation, and negative relationships between adolescents' autonomous motivation and adolescents' sexual risk behavior. In contrast, there were no indirect paths from the parental influences to adolescents' sexual risk knowledge mediated by adolescents' autonomous motivation (Hypotheses 7 and 9) or without mediation (Hypotheses 2 and 5). Another finding, contrary to that hypothesized, was a direct positive relationship between adolescent sexual risk communication and adolescent sexual risk behavior (Hypothesis 10).

Mediation may account for the absence of direct relationships between parental influences and adolescent sexual risk behavior. Parental influences may occur only through mediating processes that explain how the influences occur. Indeed, there might be innumerable other mediators that could contribute to the relationship between the parental influences and the adolescent outcome of sexual risk behavior. Mediators in the final model of this study were the respective adolescent sexual risk communications of

the mother and father autonomy support variables. In addition, adolescent autonomous motivation mediated the relationships between all, or a combination, of the parental influences in this study. Some mediators that were not included in the model, which might have influenced adolescents' sexual risk behavior, are adolescents' attitudes, beliefs, emotions, and environmental influences (Jaccard et al., 2002). The presence of these variables in the model could account for additional mediation between parental influences and the adolescent sexual risk behavior. Furthermore, as previously discussed, inclusion of different types of adolescent autonomous motivation (amotivation, controlling) (Ryan & Deci, 2000b) in this model could explain some of the unaccounted variance in this model. In addition, the measure of sexual risk behavior used in this study may not have fully captured the sexual risk of sexually inactive participants. Inclusion of attitudes or beliefs about sexual risk behavior and their intentions about sex may more accurately capture the sexually inactive person's potential for sexual risk and account for additional variance in sexual risk behavior.

Contrary to hypothesized relationships, adolescents' sexual risk behaviors were higher when adolescents reported more sexual risk knowledge. Furthermore, autonomy support of a general nature, as measured in this study, did not account for adolescents' sexual risk knowledge even though parent's autonomy support was associated with adolescents' sexual risk behavior. There are several possible explanations for this finding. The measure used in this study was primarily about assessments of knowledge about sexually transmitted diseases (STDs). For the late adolescent, sexual risk knowledge may be narrowed to abstinence or condom use with very little knowledge about STDs. Research has shown that undergraduate students became aware of STD

knowledge after being infected and gained their knowledge from a health-care provider or college class (D'Urso et al., 2007) where the primary education restrictions on sex education content (Kann et al., 2007; Kennedy & Roberts, 2009) are no longer applicable. Late adolescents who are sexually active and engaging in risky behavior may receive more information because of their sexual risk status or they may have sought more information and knowledge because they are contemplating sexual relationships. The results in this study, that the greater the sexual risk behavior, the greater the sexual risk knowledge may possibly reflect the use of a measure that primarily assessed STD knowledge. Finally, this study's findings might indicate that the influences from parents on a late adolescent college student's sexual risk knowledge are not strong and that other unmeasured factors, such as, peer influences should be examined for their contribution to the variance explained by this model.

Summary

In sum, these findings add to the body of literature supporting the tenets of self-determination theory (Deci & Ryan, 2000, 2008; Deci & Vansteenkiste, 2004) which states that satisfaction of the need for autonomy is necessary to experience optimal growth and health. Parents' autonomy support and their respective sexual risk communications when mediated by adolescents' autonomous motivation were shown to have a negative relationship with adolescents' sexual risk behavior, indicating that autonomous motivation contributes to reduced sexual risk, and thereby increases healthy behavior.

Conclusions

This study was founded in self-determination theory (SDT) (Deci & Ryan, 2000, 2008; Deci & Vansteenkiste, 2004) and results contributed information in these areas: parental autonomy support, parental sexual risk communication, adolescent autonomous motivation, adolescent sexual risk behavior, and adolescent sexual risk knowledge.

There were unique contributions by mothers and fathers to late adolescent college students' autonomous motivation to avoid sexual risk behavior. Fathers were shown to be important initiators of parental autonomy support and adolescent sexual risk communication. Some of the contributions of mothers' and fathers' autonomy support to sexual risk behavior were both direct and indirect when mediated by a parent's sexual risk communication.

The study's model demonstrated the role of late adolescent college students' autonomous motivation for avoidance of sexual risk as a mediator. This mediation was noteworthy and assisted in explaining the relationships between the parental influences (mother autonomy support, father autonomy support, mother-adolescent sexual risk communication, father-adolescent sexual risk communication) and the adolescent outcomes (sexual risk behavior, sexual risk knowledge), further adding to SDT research.

The assessment of the relationships between parental autonomy support and late adolescents' sexual risk behavior and sexual risk knowledge supports SDT by adding sexual risk behavior to the health areas examined using that theory. Concentration on the late adolescent period provided a focused examination of SDT with a specific group of adolescents in a university setting after transitioning from a home environment to a more worldly environment. Furthermore, the use of a more robust measurement of

adolescents' sexual risk behavior that included questions about specific risk behaviors expanded knowledge by providing specific information about which sexual risk had occurred (i.e., had a STD, used alcohol or drugs during sex). This was in contrast to another study examining autonomous motivation and sexual risk behavior where the assessment of sexual behavior was categorical, i.e., whether one had sex or not (Williams et al., 2000).

Finally, the use of a covariance structure analysis in this study allowed for the examination of hypothesized relationships proposed in this study's model, including relationships by mediation. In this study, the effects of mediation were measured through effect decomposition; thereby, separate direct and indirect effects of independent variables on dependent variables were identified (MacKinnon, 2008). These mediation analyses added to the statistical literature regarding multiple mediators by using new techniques (e.g., detection of the presence and significance of indirect paths that may not be apparent if only a causal steps approach to mediation was taken) (Preacher & Hayes, 2008).

Limitations

The use of a convenience sample in this study instead of a randomly selected sample limited the generalization of these findings. Forty-two percent of high school students do not attend college (Davis, J. W. & Bauman, 2008); therefore, findings from this study may not be applicable to those who do not attend college. In addition, some college students were excluded. Because of these exclusions, findings are not generalizable to college students who are married, have offspring, and grew up in a one-

parent family, or have experienced death of a biological parent.

The cross-sectional design used in this study provided only a snapshot of behavior of late adolescents, therefore, this study's findings can only be applied to a late adolescent who is 19- or 20-years-old attending a southeastern, 4-year university, during the period of this study. In contrast, a longitudinal study would provide findings over a period of time, adding to the credibility of the findings by detection of enduring behavior changes. Longitudinally designed studies are more suited to uncovering causal relationships.

Because this study was testing of a model based on self-determination theory, these variables are more pertinent than some other mediators. Failure to satisfy basic needs of autonomy, relatedness, and competence endangers psychological and physical well being (Deci, Eghrari, Patrick, & Leone, 1994); therefore, examination of all of the basic needs would provide a more comprehensive examination of mediating processes that could account for adolescent sexual risk behavior. The adolescents' experiences of feelings of competence and relatedness concerning avoidance of sexual risk behaviors were not assessed in this study.

Measurement limitations were noted in the measurement of parent-adolescent sexual risk communication. The concept of parent-adolescent sexual risk communication was complex and examinations of all dimensions associated with parent-adolescent sexual risk communication were not encompassed in this study. The parent-adolescent sexual risk measure used in this study only examined the amount of sexual risk communication from the parent to their adolescent. Other dimensions of sexual risk communication, such as quality, timing, content, context, accuracy, frequency, and style are identified in the literature as components of sexual risk communication (Jaccard et al.,

2002). Accuracy of recollections may have been an issue in late adolescents' self-reports of parent-adolescent sexual risk communication since the 19- to 20-year-old students were asked about experiences across their lifespan to date. Only adolescent self-reports, not parent reports, of parent-adolescent sexual risk communications were obtained; these self-reports might have biased the true nature of the sexual risk communication.

Limitations were also noted related to the measurement of parental autonomy support. Parental autonomy support was also measured by examining only the perspective of the adolescent. Again, further information would have been gleaned from obtaining the parents' perspectives of their autonomy support in addition to their sexual risk communication. However, there is another point of view by some researchers, who think that the adolescent's perspective offers the best explanation of the parent's sexual risk communication, because the adolescent's perceptions are more closely associated with the adolescent's own sexual behavior outcomes (Jaccard et al., 2002).

Limitations were also noted in the measurement of a sexual risk behavior. Sexual risk behavior was not confirmed with any personal interview or corroborating measure; the measure of sexual risk was solely obtained by self-report from the adolescent participant. Since the topics of parent-adolescent sexual risk communication and sexual risk knowledge and behavior are sensitive topics, participant responses were likely subject to social desirability (Weideman, 2002). In addition, reports of current sexual risk behavior (based on a period of the last 12 months) and current sexual risk knowledge were compared to past sexual risk communication from parents. Recent recollections may be more accurate than past recall. Furthermore, anonymous responses to the surveys in this study did not allow identification checks to confirm that the participants met the

age criteria for inclusion in the study, nor that the individual had not completed a survey more than one time.

Multiple measures of variables were not used in this study. The variable of adolescent sexual risk behavior was originally comprised of two manifest variables; however, the loss of one manifest variable necessitated a change in the method of statistical analysis from full structural equation modeling to path analysis. A limitation of path analysis is the use of only a single manifest variable per latent variable, which can be argued, does not usually capture a construct (Diamantopoulos & Siguaw, 2009). Future research could include multiple measures of all variables to ensure use of the full range of structural equation modeling analysis to prevent criticism of limited capturing of a construct.

Another statistical analysis issue was the combination of female and male students as one group. Trends present in different groups can be reversed when the groups are combined (Pavilides & Perlman, 2009). Therefore, differences among dyad combinations based on parent and adolescent gender could not be discussed. Mother-daughter, mother-son, father-daughter, and father-son dyads have provided different results in studies of parental autonomy support and parent-adolescent sexual risk communication studies (Clawson & Reese-Weber, 2003; Hutchinson, 2002; Hutchinson & Montgomery, 2007). Even though examination of only female and male students as part of this model estimation process did not improve model fit, the sample size of females and males individually was not sufficiently robust to provide confidence in those results.

Research and Clinical Implications

Further research is necessary to confirm this study's findings and implement recommended modifications to explain additional variance in this model. These modifications include the following.

A qualitative study should be designed and conducted to provide an in-depth understanding of why and how parents communicate autonomously with their adolescents about sexual risk. The design of this qualitative study could include focus groups consisting of mother-father-daughter, or mother-father-son with examination of sexual risk messages between parents and their adolescents. The parent-adolescent sexual risk communication scale did not measure certain qualitative aspects (i.e., context, accuracy, and style) that could further explain the type of sexual risk communication taking place between parents and their late adolescents. Measures do not exist that address these aspects of parent-adolescent sexual risk communication. A qualitative study might assist in the development of such a measurement.

Development of a new instrument to measure autonomy supportive parent-adolescent sexual risk communication might address shortcomings identified in this study regarding the measurement of general parental autonomy support and specific parent-adolescent communication. Autonomy supportive communication was not addressed in the sexual risk communication tool used. Autonomy supportive teaching has been found to add significantly to the prediction of self-determination in the school and job domains (Allen et al., 1994). Self-determined behavior is considered autonomous behavior (Deci & Ryan, 2000, 2008; Deci & Vansteenkiste, 2004). Because the autonomy support measure used was general and not specific to sexual risk

communication, assessing a parent's autonomy support during sexual risk communication might provide a more accurate assessment of parent autonomy support related to parent-adolescent sexual risk communication; stronger mediation of adolescents' autonomous motivation to avoid sexual risk might be found.

Examination of other aspects of psychological needs might further explain adolescents' sexual risk behavior. This study was designed to assess the need for autonomy; however, examination of all three basic, innate, psychological needs (e.g., autonomy, competence, and relatedness) could contribute to adolescents' healthy development and functioning. Parental autonomy support was measured to discover whether the adolescent's need of autonomy was being met. Assessing fulfillment of all three psychological needs would add additional mediators to the model and might further explain adolescents' sexual risk behavior by accounting for other mediators.

Examination of peers' and sexual partners' influences of peers and sexual partners as providers of autonomy support and sexual risk communication could explain more about adolescents' sexual risk behaviors and sexual risk knowledge. Parents are not alone in providing autonomy support or communicating about sexual risk to adolescents. Assessment of other sources of autonomy-supportive sexual risk communication such as from peers, teachers, or health professionals is warranted and could explain further variance of late adolescents' sexual risk communication and sexual risk knowledge.

Examinations of other forms of motivation (amotivation and controlling) besides autonomous motivation were not studied. Measuring other types of motivation (amotivation, controlling) (Ryan & Deci, 2000b) might expand our understanding of mediation of the relationship between parental influences (mother autonomy support,

father autonomy support, mother-adolescent sexual risk communication, father-adolescent sexual risk communication) and the adolescents' outcomes of sexual risk behavior and sexual risk knowledge. Other aspects of mother or father autonomy support and mother-adolescent or father-adolescent sexual risk communications not measured in this study might further explain adolescents' sexual risk behavior. Indeed, items on the parental autonomy support measure used in this study were more reflective of supportive behaviors rather than other aspects of autonomy support such as providing information. Modifications of the measure of autonomy support to include other elements of autonomy support might enhance model variance.

Examination of the attitudes and beliefs about sexual risk behavior might more accurately capture the non-sexually active individuals' potential for sexual risk behavior. Attitudes and beliefs about sexual risk behavior were not measured in this study.

Obtaining a larger sample size of both males and females would allow testing of differences between the two-gender dyads (mother-daughter, mother-son, father-daughter, father-son) in the future testing of the model. Findings in this study indicated that each parent contributes uniquely to adolescents' autonomous motivation. Further study of the contributions of adolescent gender is needed to establish the relevance of this model for both adolescent males and females.

Utilization of multiple measures for each variable in the future testing of the model could ensure the use of the full range of structural equation modeling techniques. Creation of multiple manifest variables could better inform the nature of each variable used in the model.

Clinical implications from this study include the following items.

Clinicians should not assume that the amount of sexual risk communication between parents and their adolescents is key in reducing adolescents' sexual risk behavior nor in increasing adolescents' sexual risk knowledge. Clinicians should encourage parents to be autonomy supportive in all messages about health to their adolescents because adolescents' autonomous motivation was key to reductions in adolescents' reports of their sexual risk behavior.

Clinicians should educate parents on how parents' different roles are unique to their adolescents and emphasize that fathers can play an important role in the late adolescents' development of autonomous motivation. In this study, fathers had a direct influence on their late adolescents' autonomous motivation to not engage in sexual risk behavior.

Clinicians should assess sexual risk knowledge of late adolescents who are attending college especially related to STDs. Clinicians should provide education to address knowledge deficits. Seventy percent of this study's participants were sexually active and 4.8% of participants answered positively to the question, have you ever had a sexually transmitted disease (e.g. syphilis, gonorrhea).

Clinicians could be more global in their approach and develop an orientation class on sexual risk that could be offered to in-coming college freshman and their parents with the purposes of building an autonomy supportive discussion of sexual risk behavior and ways to avoid sexual risk.

References

- Abbey-Harris, N., & Planned Parenthood Association of Santa Cruz County, C. A. (1984). *Homework for parents and teens. Family life education.*
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11–39). Heidelberg: Springer.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Allen, J. P., Hauser, S. T., Bell, K. L., & O'Connor, T. G. (1994). Longitudinal assessment of autonomy and relatedness in adolescent-family interactions as predictors of adolescent ego development and self-esteem. *Child Development*, 65(1), 179-194.
- Ancheta, R., Hynes, C., & Shrier, L. A. (2005). Reproductive Health Education and Sexual Risk Among High-Risk Female Adolescents and Young Adults. *Journal of Pediatric & Adolescent Gynecology*, 18(2), 105-111.
- Aquilino, M. L., & Bragadottir, H. (2000). Adolescent pregnancy. Teen perspectives on prevention. *The American Journal of Maternal Child Nursing*, 25(4), 192-197.
- Arnett, J. J. (2000). Emerging adulthood. A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469-480.
- Arnett, J. J. (2007). Socialization in emerging adulthood. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research.* (pp. 208-231). New York: The Guilford Press.

- Baguley, T. (2009). Standardized or simple effect size: What should be reported? *British Journal of Psychology*, *100*, 603-617.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs: NJ: Prentice Hall.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs: NJ: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Bearinger, L. H., Sieving, R. E., Ferguson, J., & Sharma, V. (2007). Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential. *Lancet*, *369*(9568), 1220-1231.
- Bell, D. C., & Bell, L. G. (1983). Parental validation and support in the development of adolescent daughters. In H. D. Grotevant & C. R. Cooper (Eds.), *Adolescent development in the family*. San Francisco, CA: Jossey-Bass.
- Bentler, P. M., & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*(3), 588-606.
- Bollen, K. A. (1989). *Structural Equations with Latent Variables*. New York: Wiley.
- Bronfenbrenner, U. (1989). Ecological systems theory. *Annals of Child Development*, *6*, 556-581.
- Burns, N., & Grove, S. K. (2005). *The practice of nursing research* (5th ed.). St. Louis, MO: Elsevier Saunders.
- Busse, P., Fishbein, M., Bleakley, A., & Hennessy, M. (2010). The role of communication with friends in sexual initiation. *communication Research*, *37*(2), 239-255.

- Bynum, M. S. (2007). African American mother-daughter communication about sex and daughters' sexual behavior: does college racial composition make a difference? *Cultural Diversity & Ethnic Minority Psychology, 13*(2), 151-160.
- Cameron, T. A., DeShazo, J. R., & Johnson, E. H. (2010). The effect of children on adult demands for health-risk reductions. *Journal of Health Economics, 29*(3), 364-376.
- Carmines, E. G., & McIver, J. P. (1983). An introduction of the analysis of models with unobserved variables. *Political Methodology, 9*(1), 51-102.
- Catalano, R. F., & Hawkins, J. D. (1996). The social development model: A theory of antisocial behavior. In J. D. Hawkins (Ed.), *Delinquency and crime: Current theories* (pp. 149-197). New York: Cambridge University Press.
- CDC. (1998). Youth risk behavior surveillance—United States, 1997. *Morbidity & Mortality Weekly Report, 47*(SS-3).
- CDC. (2008). Youth risk behavior surveillance—United States, 2007. *Morbidity & Mortality Weekly Report 57*(SS-4), 1–136.
- CDC. (2009a). *HIV/AIDS surveillance report, 2007*. Centers for Disease Control and Prevention Retrieved from <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2007report/pdf/2007SurveillanceReport.pdf>.
- CDC. (2009b). *Sexually Transmitted Disease Surveillance, 2008*. Atlanta, GA: U.S. Department of Health and Human Services; November 2009.
- CDC. (2010). *HIV Surveillance Report, 2008*. U.S. Department of Health and Human Services.

- Chandra, A., Martino, S. C., Collins, R. L., Elliott, M. N., Berry, S. H., Kanouse, D. E., & Miu, A. (2008). Does Watching Sex on Television Predict Teen Pregnancy? Findings From a National Longitudinal Survey of Youth. *Pediatrics, 122*(5), 1047-1054. doi: 10.1542/peds.2007-3066
- Cheung, M. W. (2009). Comparison of methods for constructing confidence intervals of standardized indirect effects. *Behavior Research Methods, 41*(2), 425-438.
- Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and U. S. Adolescents: Common effects on well-being and academic motivation. *Journal of Cross-Cultural Psychology, 32*(5), 618-635.
- Chirkov, V. I., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: a self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology, 84*(1), 97-110.
- Clawson, C. L., & Reese-Weber, M. (2003). The amount and timing of parent-adolescent sexual communication as predictors of late adolescent sexual risk-taking behaviors. *Journal of Sex Research, 40*(3), 256-265.
- Collins, R. L., Elliott, M. N., Berry, S. H., Kanouse, D. E., Kunkel, D., Hunter, S. B., & Miu, A. (2004). Watching sex on television predicts adolescent initiation of sexual behavior. *Pediatrics, 114*(3), e280-289.
- Coyle, K., Basen-Engquist, K., Kirby, D., Parcel, G., Banspach, S., Harrist, R.... (1999). Short-term impact of safer choices: a multicomponent, school-based HIV, other STD, and pregnancy prevention program. *Journal of School Health, 69*(5), 181-188.

- D'Urso, J., Thompson-Robinson, M., & Chandler, S. (2007). HPV Knowledge and behaviors of Black college students at a historically Black university. *Journal of American College Health, 56*(2), 15--163.
- Davis, C., So-Kum Tang, C., Fiona Chan, S.-F., & Noel, B. (1999). The Development and Validation of the International AIDS Questionnaire-Chinese Version (IAQ-C). *Educational & Psychological Measurement, 59*(3), 481.
- Davis, J. W., & Bauman, K. J. (2008). *School Enrollment in the United States: 2006*. U. S. Department of Commerce Retrieved from <http://www.census.gov/prod/2008pubs/p20-559.pdf>.
- Deci, E. L., & Ryan, R. M. (1985a). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19*, 109-134.
- Deci, E. L., & Ryan, R. M. (1985b). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*(6), 1024-1037.
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227.
- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology, 49*(3), 182-185.
- Deci, E. L., & Vansteenkiste, M. (2004). Self-determination theory and basic need satisfaction: Understanding human development in positive psychology. *Ricerche di Psicologia, 27*(1), 23-40.

- Diamantopoulos, A., & Siguaw, J. A. (2009). *Introducing LISREL*. Thousand Oaks, CA: SAGE Publications Ltd.
- DiIorio, C., Dudley, W. N., Lehr, S., & Soet, J. E. (2000). Correlates of safer sex communication among college students. *Journal of Advanced Nursing, 32*(3), 658-665.
- DiIorio, C., Kelley, M., & Hockenberry-Eaton, M. (1999). Communication about sexual issues: mothers, fathers, and friends. *Journal of Adolescent Health, 24*(3), 181-189.
- DiIorio, C., McCarty, F., & Denzmore, P. (2006). An exploration of social cognitive theory mediators of father-son communication about sex. *Journal of Pediatric Psychology, 31*(9), 917-927.
- DiIorio, C., Resnicow, K., Dudley, W. N., Thomas, S., Wang, D. T., Van Marter, D. F.... (2000). Social cognitive factors associated with mother-adolescent communication about sex. *Journal of Health Communication, 5*(1), 41-51.
- Dutra, R., Miller, K. S., & Forehand, R. (1999). The process and content of sexual communication with adolescents in two-parent families: associations with sexual risk-taking behavior. *AIDS & Behavior, 3*(1), 59-66.
- Eccles, J. S., & Davis-Kean, P. E. (2005). Influences of parents' education on their children's educational attainments: The role of parent and child perceptions. *London Review of Education, 3*(3), 191-204.
- Elliott, G. R., & Feldman, S. S. (1990). Capturing the adolescent experience. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 1-14). Cambridge, MA: Harvard University Press.

- Erikson, E. H. (1968). *Identity: Youth in crisis*. New York: W. W. Norton.
- Field, A. (2005a). *Discovering statistics using SPSS* (2 ed.). Thousand Oaks, CA: Sage Publications.
- Field, A. (2005b). *Discovering statistics using SPSS* (2nd ed.). Thousand Oaks: Sage Publications.
- Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, *111*(3), 455-474.
- Fisher, T. D. (1987). Family communication and the sexual behavior and attitudes of college students. *Journal of Youth and Adolescence*, *16*(5), 481-495.
- Fisher, T. D. (1993). A Comparison of Various Measures of Family Sexual Communication: Psychometric Properties, Validity, and Behavioral Correlates. *Journal of Sex Research*, *30*(3), 229-238.
- Fowler, F. J., & Cosenza, C. (2008). Writing effective questions. In E. D. deLeeuw, J. J. Hox & D. A. Dillman (Eds.), *International handbook of survey methodology* (pp. 136-160). New York: Lawrence Erlbaum Associates.
- Fox, G., & Inazu, J. (1980). Patterns and Outcomes of Mother-Daughter Communication about Sexuality. *Journal of Social Issues*, *36*(1), 7-29.
- Galvan, A., Hare, T. A., Parra, C. E., Penn, J., Voss, H., Glover, G., & Casey, B. J. (2006). Earlier development of the accumbens relative to orbitofrontal cortex might underlie risk-taking behavior in adolescents. *Journal of Neuroscience*, *26*(25), 6885-6892.

- George, W. H., Gournic, S. J., & McAfee, M. P. (1988). Perceptions of postdrinking female sexuality: Effects of gender, beverage choice, and drink payment. *Journal of Applied Social Psychology, 18*(15), 1295-1317.
- Gerend, M. A., & Magloire, Z. F. (2008). Awareness, knowledge, and beliefs about Human Papillomavirus in a racially diverse sample of young adults. *Journal of Adolescent Health, 42*, 237-242.
- Goodwin, P. Y., Mosher, W. D., & Chandra, A. (2010). *Marriage and cohabitation in the United States: A statistical portrait based on Cycle 6 (2002) of the National Survey of Family Growth.*: National Center for Health Statistics.
- Greenstein, T. N. (2006). *Methods of Family Research* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Grolnick, W. S., Deci, E. L., & Ryan, R. M. (1997). Internalization within the family: The self-determination theory perspective. In J. E. Grusec & L. Kuczynski (Eds.), *Parenting and children's internalization of values: A handbook of contemporary theory.* (pp. 135-161). New York, NY: John Wiley & Sons Inc.
- Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's self-regulation and competence in school. *Journal of Educational Psychology, 81*(2), 143-154.
- Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). Inner resources for school achievement: Motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology, 83*(4), 508-517.

- Grolnick, W. S., Weiss, L., McKenzie, L., & Wightman, J. (1996). Contextual, cognitive, and adolescent factors associated with parenting in adolescence. *Journal of Youth & Adolescence, 25*, 33-54.
- Grotevant, H. D., & Cooper, C. R. (1986). Individuation in family relationships: A perspective on individual differences in the development of identity and role-taking skill in adolescence. *Human Development, 29*(2), 82-100.
- Guilamo-Ramos, V., Jaccard, J., Dittus, P., Gonzalez, B., & Bouris, A. (2008). A conceptual framework for the analysis of risk and problem behaviors: The case of adolescent sexual behavior. *Social Work Research, 32*(1), 29-45.
- Hamilton, B. E., Martin, J. A., & Ventura, S. J. (2010). *National Center for Health Statistics: Births, preliminary data for 2008*. U.S. Department of Health and Human Services.
- Harris, K. M., Halpern, C. T., Entzel, P., Tabor, J., Bearman, P. S., & Udry, J. R. (2008). The National Longitudinal Study of Adolescent Health: Research Design Retrieved 4/08/09, 2009, from <http://www.cpc.unc.edu/projects/addhealth/design>
- Heisler, J. M. (2005). Family communication about sex: Parents and college-aged offspring recall discussion topics, satisfaction, and parental involvement. *Journal of Family Communication, 5*(4), 295-312.
- Hildebrand, D. K. (1986). *Statistical thinking for behavioral scientists*. Boston, MA: Duxbury Press.
- Hill, J. P., & Holmbeck, G. N. (1986). Attachment and autonomy during adolescence. *Annals of Child Development, 3*, 145-189.

- Hockenberry-Eaton, M., Richman, M. J., Dilorio, C., Rivero, T., & Maibach, E. (1996). Mother and adolescent knowledge of sexual development: the effects of gender, age, and sexual experience. *Adolescence, 31*(121), 35-47.
- Hollingshead, A. B. (1965). *Four factor index of social status*. New Haven, CT: Yale University.
- Homish, G. G., & Leonard, K. E. (2008). Spousal influence on general health behaviors in a community sample. *American Journal of Health Behavior, 32*(6), 754-763.
- Hovell, M., Sipan, C., Blumberg, E., Atkins, C., & Hofstetter, C. R. (1994). Family Influences on Latino and Anglo Adolescents' Sexual Behavior. *Journal of Marriage & Family, 56*(4), 973-986.
- Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: Sage.
- Hutchinson, M. K. (1994). Sexual Risk Perceptions and Protective Strategies of Young Adult Heterosexual Women: Family and Dyad Influences. *DAI, 56*(01A), 296.
- Hutchinson, M. K. (1999). Individual, family, and relationship predictors of young women's sexual risk perceptions. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 28*(1), 60-67.
- Hutchinson, M. K. (2002). The influence of sexual risk communication between parents and daughters on sexual risk behaviors. *Family Relations, 51*(3), 238-247.
- Hutchinson, M. K. (2007). The Parent-teen sexual risk communication scale (PTSRC-III): Instrument development and psychometrics. *Nursing Research, 56*(1), 1-8.

- Hutchinson, M. K., & Cooney, T. M. (1998). Patterns of parent-teen sexual risk communication: Implications for intervention. *Family Relations, 47*(2), 185-194.
- Hutchinson, M. K., Jemmott, J. B., 3rd, Jemmott, L. S., Braverman, P., & Fong, G. T. (2003). The role of mother-daughter sexual risk communication in reducing sexual risk behaviors among urban adolescent females: A prospective study. *Journal of Adolescent Health, 33*(2), 98-107.
- Hutchinson, M. K., & Montgomery, A. J. (2007). Parent communication and sexual risk among African Americans. *Western Journal of Nursing Research, 29*(6), 691-707.
- Hutchinson, M. K., Sosa, D., & Thompson, A. C. (2001). Sexual protective strategies of late adolescent females: More than just condoms. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 30*(4), 429-438.
- Hutchinson, M. K., & Wood, E. B. (2007). Reconceptualizing adolescent sexual risk in a parent-based expansion of the theory of planned behavior. *Journal of Nursing Scholarship, 39*(2), 141-146.
- Inungu, J., Mumford, V., Younis, M., & Langford, S. (2009). HIV knowledge, attitudes and practices among college students in the United States. *Journal of Health and Human Services Administration, Winter*, 260-277.
- Jaccard, J. (2004). Recalling sexual partners, the accuracy of self-reports. *The Journal of Health Psychology, 9*(6), 699-712.
- Jaccard, J., & Dittus, P. J. (2000). Adolescent perceptions of maternal approval of birth control and sexual risk behavior. *American Journal of Public Health, 90*(9), 1426-1430.

- Jaccard, J., Dittus, P. J., & Gordon, V. V. (2000). Parent-teen communication about premarital sex: Factors associated with the extent of communication. *Journal of Adolescent Research, 15*(2), 187-208.
- Jaccard, J., Dodge, T., Dittus, P., Feldman, S. S., & Rosenthal, D. A. (2002). Parent-adolescent communication about sex and birth control: A conceptual framework *Talking sexuality: Parent-adolescent communication*. (pp. 9-41). San Francisco, CA US: Jossey-Bass.
- Jaworski, B. C., & Carey, M. P. (2007). Development and psychometric evaluation of a self-administered questionnaire to measure knowledge of sexually transmitted diseases. *AIDS and Behavior, 11*(4), 557-574.
- Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York: Academic Press.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL, 8: The SIMPLIS Command Language*. Chicago, IL: SPSS.
- Kahlbaugh, P., Lefkowitz, E. S., Valdez, P., & Sigman, M. (1997). The affective nature of mother-adolescent communication concerning sexuality and conflict. *Journal of Research on Adolescence, 7*(2), 221-239.
- Kann, L., TellJohann, S. K., & Wooley, S. F. (2007). Health education: Results from the school health policies and programs study 2006. *Journal of School Health, 77*(8), 408-434.
- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin, 22*, 80-87.

- Kennedy, B. L., & Roberts, S. T. (2009). Truths and myths that influence the sexual decision-making process among young multiethnic college women. *Archives of Psychiatric Nursing, 23*(5), 366-375.
- Kippax, S., & Race, K. (2003). Sustaining safe practice: Twenty years on. *Social Science & Medicine, 57*(1), 1.
- Kirby, D., Miller, B. C., Feldman, S. S., & Rosenthal, D. A. (2002). Interventions designed to promote parent-teen communication about sexuality *Talking sexuality: Parent-adolescent communication*. (pp. 93-110). San Francisco, CA US: Jossey-Bass.
- Kirkman, M., Rosenthal, D. A., & Feldman, S. S. (2002). Talking to a Tiger: Fathers Reveal Their Difficulties in Communicating about Sexuality with Adolescents. *New Directions for Child and Adolescent Development*(97), 57-74.
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (2011). *Enrollment in Postsecondary Institutions, Fall 2009; Graduation Rates, 2003 & 2006 Cohorts; and Financial Statistics, Fiscal Year 2009 (NCES 2011-230)*. Washington, DC: National Center for Education Statistics Retrieved from <http://nces.ed.gov/pubs2011/2011230.pdf>.
- Kogan, S., Brody, G., Gibbons, F., Murry, V., Cutrona, C., Simons, R.... (2008). The Influence of Role Status on Risky Sexual Behavior Among African Americans During the Transition to Adulthood. *The Journal of Black Psychology, 34*(3), 399-420.
- 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.

- Lefkowitz, E. S. (2002). Beyond the yes-no question: Measuring parent-adolescent communication about sex. *New Directions for Child and Adolescent Development, 97*, 43-56.
- Lefkowitz, E. S., & Espinosa-Hernandez, G. (2007). Sex-related communication with mothers and close friends during the transition to university. *Journal of Sex Research, 44*(1), 17-27.
- Lehr, S. T., DiIorio, C., Dudley, W. N., & Lipana, J. A. (2000). The relationship between parent-adolescent communication and safer sex behaviors in college students. *Journal of Family Nursing, 6*(2), 180-196.
- Lescano, C. M., Hadley, W. S., Beausoleil, N. I., Brown, L. K., D'Eramo, D., & Zimskind, A. (2007). A brief screening measure of adolescent risk behavior. *Child Psychiatry and Human Development, 37*(4), 325-336.
- Levesque, C. S., Williams, G. C., Elliot, D., Pickering, M. A., Bodenhamer, B., & Finley, P. J. (2007). Validating the theoretical structure of the Treatment Self-Regulation Questionnaire (TSRQ) across three different health behaviors. *Health Education Research, 22*(5), 691-702.
- Lindberg, L. D., Santelli, J. S., & Singh, S. (2006). Changes in formal sex education: 1995-2002. *Perspectives on Sexual and Reproductive Health, 38*(4), 182-189.
- Maccoby, E. E., Grusec, J. E., & Hastings, P. D. (2007). Historical overview of socialization research and theory. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research*. (pp. 13-41). New York, NY US: Guilford Press.

- Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical properties. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling: Issues and techniques* (pp. 315-353). Mahwah, NJ: Lawrence Erlbaum Associate.
- Martino, S. C., Collins, R. L., Elliott, M. N., Strachman, A., Kanouse, D. E., & Berry, S. H. (2006). Exposure to degrading versus nondegrading music lyrics and sexual behavior among youth. *Pediatrics*, *118*(2), e430-e441.
- Mather, M., & Adams, D. (2007). *The Crossover in Female-Male College Enrollment Rates*. Population Reference Bureau.
- Mosher, W. D., Chandra A, & J., J. (2005). *Sexual behavior and selected health measures: Men and women 15–44 years of age, United States, 2002*. CDC/National Center for Health Statistics.
- Munro, B. H. (2005). *Statistical methods for health care research*. Philadelphia, PA: Lippincott.
- Neighbors, C., Walker, D. D., & Larimer, M. E. (2003). Expectancies and evaluations of alcohol effects among college students: Self-determination as a moderator. *Journal of Studies on Alcohol*, *64*(2), 292-300.
- Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence*, *29*(5), 761-775.
- Norusis, M. J. (1993). *SPSS for Windows based Systems User's Guide, Release 6.0*. Chicago, IL: SPSS.

- O'Sullivan, L. F., Jaramillo, B. M. S., Moreau, D., & Meyer-Bahlburg, H. F. L. (1999). Mother-Daughter Communication about Sexuality in a Clinical Sample of Hispanic Adolescent Girls. *Hispanic Journal of Behavioral Sciences, 21*(4), 447-469.
- O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of component using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, & Computers, 32*, 396-401.
- Ozer, D. J. (2007). Evaluating effect size in personality research. In R. W. Robins, R. C. Fraley & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 495-501). New York, NY The Guilford Press.
- Parse, R. (1992). Human becoming: Parse's theory of nursing. *Nursing Science Quarterly, 5*, 35-42.
- Petersen, A. C., & Leffert, N. (1995). Developmental issues influencing guidelines for adolescent health research: a review. *Journal of Adolescent Health, 17*(5), 298-305.
- Polulech, J. B., Nuttall, P., & Connecticut Univ, S. C. E. S. (1988a). *Communication and Negotiation. Growing Pains: Sex Education for Parents. A Newsletter Series. Letter IV.*
- Polulech, J. B., Nuttall, P., & Connecticut Univ, S. C. E. S. (1988b). *Puberty/Adolescence. Growing Pains: Sex Education for Parents. A Newsletter Series. Letter III.*
- Polulech, J. B., Nuttall, P., & Connecticut Univ, S. C. E. S. (1988c). *Self-Esteem. Growing Pains: Sex Education for Parents. A Newsletter Series. Letter II.*

- Polulech, J. B., Nuttall, P., & Connecticut Univ, S. C. E. S. (1988d). *Sexuality. Growing Pains: Sex Education for Parents. A Newsletter Series. Letter I.*
- Polulech, J. B., Nuttall, P., & Connecticut Univ, S. C. E. S. (1988e). *Talking about Sex. Growing Pains: Sex Education for Parents. A Newsletter Series. Letter V.*
- Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D. Slater & L. B. Synder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research* (pp. 13-54). Thousand Oaks, CA: Sage.
- Preacher, K. J., & Kelley, K. (2010). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, doi: 10.1037/a0022658
- Rapsey, C., & Murachver, T. (2006). Adolescent sexuality. In R. D. McAnulty & M. M. Burnette (Eds.), *Sex and sexuality* (Vol. 1, pp. 61-101). Westport, CT: Praeger.
- Ratelle, C. F., Larose, S., Guay, F., & Sene'cal, C. (2005). Perceptions of parental involvement and support as predictors of college students' persistence in a science curriculum. *Journal of Family Psychology*, 19(2), 286-293.
- Robbins, R. J. (1994). *An assessment of perceptions of parental autonomy support and control: Child and parent correlates*. PhD Doctoral Dissertation, University of Rochester.
- Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, 147, 598-611.
- Ryan, R. M. (1992). Agency and organization: intrinsic motivation, autonomy, and the self in psychological development. *Nebraska Symposium on Motivation*, 40, 1-56.

- Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality, 63*(3), 397-427.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: examining reasons for acting in two domains. *Journal of Personality and Social Psychology, 57*(5), 749-761.
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54-67.
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68.
- Ryan, R. M., Deci, E. L., & Grolnick, W. S. (1995). Autonomy, relatedness, and the self: Their relation to development and psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Theory and methods* (Vol. 1, pp. 618-655). New York, NY: Wiley.
- Ryan, R. M., Deci, E. L., Grolnick, W. S., & La Guardia, J. G. (2006). The significance of autonomy and autonomy support in psychological development and psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (2nd ed., Vol. 1). Hoboken, NJ: Wiley.
- Ryan, R. M., & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology, 50*(3), 550-558.

- Ryan, R. M., & Lynch, J. H. (1989). Emotional autonomy versus detachment: Revisiting the vicissitudes of adolescence and young adulthood. *Child Development, 60*(2), 340.
- Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on Self-Determination Theory. *The European Health Psychologist, 10*.
- Ryan, R. M., Plant, R. W., & O'Malley, S. (1995). Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout. *Addictive Behaviors, 20*, 279-297.
- Ryan, R. M., & Stiller, J. D. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and self-esteem. *Journal of Early Adolescence, 14*(2), 226.
- Sandfort Jr., P. A. (2009). Knowledge, attitudes, and informational behaviors of college students in regard to the human papillomavirus. *Journal of American College Health, 58*(2), 141-149.
- Santelli, J., Ott, M. A., Lyon, M., Rogers, J., Summers, D., & Schleifer, R. (2006). Abstinence and abstinence-only education: A review of U.S. policies and programs. *Journal of Adolescent Health, 38*(1), 72-81.
- Schuster, M. A., Corona, R., Elliott, M. N., Kanouse, D. E., Eastman, K. L., Zhou, A. J., & Klein, D. J. (2008). Evaluation of Talking Parents, Healthy Teens, a new worksite based parenting programme to promote parent-adolescent communication about sexual health: randomised controlled trial. *British Medical Journal, 337*, a308.

- Shapiro, J., Radecki, S., Charchian, A. S., & Josephson, V. (1999). Sexual behavior and Aids-related knowledge among community college students in Orange County, California. *Journal of Community Health, 24*(1), 29-43.
- Shrier, L. A., Ancheta, R., Goodman, E., Chiou, V. M., Lyden, M. R., & Emans, S. J. (2001). Randomized controlled trial of a safer sex intervention for high-risk adolescent girls. *Archives of Pediatric & Adolescent Medicine, 155*(1), 73-79.
- Shrier, L. A., Goodman, E., & Emans, S. J. (1999). Partner condom use among adolescent girls with sexually transmitted diseases. *Journal of Adolescent Health, 24*(5), 357-361.
- Singh, S., & Darroch, J. E. (2000). Adolescent pregnancy and childbearing: levels and trends in developed countries. *Family Planning Perspectives, 32*(1), 14-23.
- Soenens, B., & Vansteenkiste, M. (2005). Antecedents and outcomes of self-determination in 3 life domains: The role of parents' and teachers' autonomy support. *Journal of Youth & Adolescence, 34*(6), 589-604.
- Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Beyers, W., & Ryan, R. M. (2007). Conceptualizing parental autonomy support: adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental Psychology, 43*(3), 633-646.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics* (4th ed.). Boston: Allyn and Bacon.
- Taylor, A. B., MacKinnon, D. P., & Tein, J. (2007). Tests of the three-path mediated effect. *Organizational Research Methods, 1*-29.

- U.S. (2007). *Degree-granting institutions, number and enrollment by state: 2007*. U.S. Department of Commerce Retrieved from http://www.census.gov/compendia/statab/cats/education/higher_education_institutions_and_enrollment.html.
- Ulman, J. B. (1996). Structural equation modeling. In L. S. Fisdell (Ed.), *Using multivariate statistics*. New York, New York: Harper Collins.
- US. (1988). *Understanding AIDS*. U.S. Government Printing Office.
- US. (2000a). *Age groups and sex: 2000*. Retrieved from http://factfinder.census.gov/servlet/QTable?_bm=y&-geo_id=01000US&-qr_name=DEC_2000_SF2_U_QTP1&-reg=DEC_2000_SF2_U_QTP1:001&-ds_name=DEC_2000_SF2_U&-lang=en&-format=&-CONTEXT=qt.
- US. (2000b). *Healthy People 2010: Understanding and Improving Health*. Washington, DC: U.S. Government Printing Office Retrieved from <http://www.health.gov/healthypeople/>.
- Waltz, C. F., Strickland, O. L., & Lenz, E. R. (2005). *Measurement in Nursing and Health Research* (Third ed.). New York, NY: Springer Publishing Company, Inc.
- Warren, C. (1995). Parent-child communication about sex. In C. Warren, T. J. Socha & G. H. Stamp (Eds.), *Parents, children, and communication: Frontiers of theory and research*. (pp. 173-201). Hillsdale, NJ England: Lawrence Erlbaum Associates, Inc.
- Weiderman, M. W. (2002). Reliability and validity of measurement. In M. W. Wiederman & B. E. Whitley, Jr. (Eds.), *Handbook for conducting research on human sexuality*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Weinstock, H., Berman, S., & Cates, W., Jr. (2004). Sexually transmitted diseases among American youth: Incidence and prevalence estimates, 2000. *Perspectives on Sexual and Reproductive Health*, 36(1), 6-10.
- White, J. M., & Klein, D. M. (2002). *Family Theories* (Second ed.). Thousand Oaks, CA: Sage Publications.
- Williams, G. C., Cox, E. M., Kouides, R. W., & Deci, E. L. (1999). Presenting the facts about smoking to adolescents. *Archives of Pediatrics and Adolescent Medicine*, 153, 939-964.
- Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, 70(1), 115-126.
- Williams, G. C., Hedberg, V. A., Cox, E. M., & Deci, E. L. (2000). Extrinsic life goals and health-risk behaviors in adolescents. *Journal of Applied Social Psychology*, 30(8), 1756-1771.
- Williams, G. C., Lynch, M. F., McGregor, H. A., Ryan, R. M., Sharp, D., & Deci, E. L. (2006). Validation of the "Important Other" Climate Questionnaire: Assessing autonomy support for health-related change. *Families, Systems & Health: The Journal of Collaborative Family HealthCare*, 24(2), 179-194.
- Williams, G. C., McGregor, H., Zeldman, A., Freedman, Z., & Deci, E. L. (2004). Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychology*, 23(1), 58-66.

- Williams, G. C., Rodin, G. C., Ryan, R. M., Grolnick, W. S., & Deci, E. L. (1998). Autonomous regulation and long-term medication adherence in adult outpatients. *Health Psychology, 17*(3), 269-276.
- Wills, T. A., Gibbons, F. X., Gerrard, M., Murry, V. M., & Brody, G. H. (2003). Family communication and religiosity related to substance use and sexual behavior in early adolescence: A test for pathways through self-control and prototype perceptions. *Psychology of Addictive Behaviors, 17*, 312-323.
- Wong, M. M. (2008). Perceptions of parental involvement and autonomy support: Their relations with self-regulation, academic performance, substance use and resilience among adolescents. *North American Journal of Psychology, 10*(3), 497-518.
- Youniss, J., & Smollar, J. (1985). *Adolescent relations with mothers, fathers, and friends*. Chicago, IL: University of Chicago Press.

APPENDIX A - TABLES RELATED TO INTEGRATED LITERATURE REVIEW

APPENDIX A - TABLE 1

Parent-Adolescent Sexual Risk Communication Studies: Main Findings

Author(s) Year	Purpose(s)	Main findings
Bynum, 2007	<p>1. Examine if and how the type and quality of mother-daughter communication predicted daughters' premarital sex attitudes and sexual experience among upwardly mobile African American late adolescents who were transitioning to college.</p> <p>2. Assess whether there were differences in sexual attitudes and behavior based on the type of secondary institution attended (historically Black college/university or primarily White public institution) among African American late adolescents.</p>	<p>1.1 In step 1 of a hierarchical regression model, mothers' perception of frequency of sexual risk communication was found to be a positive predictor of daughters' permissive attitudes about premarital sexual behavior ($\beta = .13, p < .001$). The other predictors in this model were daughter's college affiliation, mother's report of conservative attitudes, and daughter's perception of quality of general communication with their mothers. In step 2 of this regression model, the interaction effects of college and maternal conservative attitudes, college and mother's perception of frequency of sexual risk communication, and daughter's perception of quality of general communication and mothers' perception of frequency of sex risk communication were examined for their association with daughters' permissive attitudes about premarital sex. The interaction of mothers' perception of frequency of sexual risk communication and college affiliation was a positive predictor of daughters' permissive attitudes about premarital sexual behavior ($\beta = .17, p < .05$). Full model, $F(5, 66) = 11.30, p < .001$.</p> <p>1.2 In the second hierarchical regression model, college affiliation, daughter's perception of quality of general communication, maternal conservative attitudes, and mothers' perception of frequency communication about sexual topics were tested for their association with sexual experience among daughters. Mothers' perception of frequency of sexual risk communication ($\beta = .25, p < .01$) was a positive predictor of daughters' level of sexual experience. Daughter's perception of increased quality of general communication from mothers ($\beta = -1.30, p < .05$) predicted daughters' decreased sexual experience. Full model, $F(5, 66) = 4.01, p < .01$.</p> <p>2. Daughters from the historically Black colleges/universities were more likely to have attitudes congruent with their mothers; if their mothers had more conservative attitudes about premarital sex than their daughters held less permissive sexual attitudes about premarital sex ($\beta = -.60, p < .001$). However, the greater mothers' perceptions of frequency of sexual risk communication the more likely daughters from the historically Black colleges/universities had permissive attitudes about premarital sex ($\beta = .17, p < .05$). No patterns among college affiliation and communication variables were detected among the mothers and daughters from the primarily White institutions.</p>

Author(s) Year	Purpose(s)	Main findings
3. Determine if there was a moderation effect of general communication on the relationship between mother sexual communication and daughters' sexual experience.	3. The interaction of mothers' perception of frequency of sexual risk communication and daughter's perception of the quality of general communication was a positive predictor of daughters' level of sexual experience ($\beta = .43, p < .01$), which supported a moderating effect of daughter's perception of the quality of general communication on the relationship between mothers' perception of frequency of communication about sexual topics and daughters' level of sexual experience, $F(5,66) = 4.01, p < .01$.	In the second hierarchical regression model, there was no difference between those daughters' levels of sexual experience attending historically Black colleges/universities and those attending primarily White institutions.
Clawson & Reese-Weber, 2003	<p>1. Examine the timing (before or after adolescent sexual initiation) of sexual discussion with both parents after controlling for the amount of sexual risk communication and the relationship to adolescents' sexual risk taking behaviors.</p> <p>2. Examine the interaction between the amount of parent-adolescent sexual risk communication and the timing of parent-adolescent discussion about sexual intercourse and the relationship to adolescents' sexual risk taking behaviors.</p>	<p>Demographic variables were not included in the regression analyses to conserve statistical power.</p> <p>1.1 On-time father- and mother-adolescent sexual risk communication (communication that occurred prior to an adolescent's sexual initiation) was associated with one sexual risk-taking behavior, i.e., having been or gotten someone pregnant (father, $\Delta R^2 = .03, p < .05$, mother, $\Delta R^2 = .02, p < .05$), and with two factors that reduce sexual risk taking behavior, i.e., being older at first intercourse (father, $\Delta R^2 = .07, p < .01$; mother, $\Delta R^2 = .10, p < .01$), having fewer lifetime sexual partners (father, $\Delta R^2 = .05, p < .01$; mother, $\Delta R^2 = .06, p < .01$). In addition, mother-adolescent on-time sexual risk communication was associated with another factor believed to reduce sexual risk taking behavior, using multiple methods of birth control ($\Delta R^2 = .03, p < .05$).</p> <p>1.2 Adolescents indicated that 36.9% had experienced on-time sexual risk communication with their father, while 57.9% had experienced off-time sexual risk communication with their father. Adolescents reported that 57% had experienced on-time sexual risk communication with their mothers while 41.6% had experienced off-time sexual risk communication with their mothers.</p> <p>2.1 Regardless of amount, father-adolescent sexual risk communication coupled with on-time father-adolescent discussion about sexual intercourse was associated with being older at first intercourse ($\Delta R^2 = .03, p < .05$). Greater amounts of father-adolescent sexual risk communication coupled with off-time father-adolescent discussion about sexual intercourse was associated with being older at first intercourse ($\Delta R^2 = .03, p < .05$) and having been or gotten someone pregnant ($\Delta R^2 = .02, p < .05$).</p> <p>2.2 Lesser amounts of father-adolescent sexual risk communication coupled with off-time father-adolescent discussion about sexual intercourse was associated with being younger at first intercourse ($\Delta R^2 = .03, p < .05$).</p>

Author(s) Year	Purpose(s)	Main findings
3. Examine the relationship of the amount of parent-adolescent sexual risk communication to several adolescent sexual risk taking behaviors.	3. More mother-adolescent sexual risk communication and more father-adolescent sexual risk communication was associated with two sexual risk-taking behaviors, i.e., being younger at first intercourse (father and mother; $\Delta R^2 = .04, p < .01$), having more lifetime sexual partners (father, $\Delta R^2 = .03, p < .05$; mother, $R^2 \Delta = .02, p < .05$). In addition, more mother-adolescent sexual risk communication was associated with two more sexual risk-taking behaviors, i.e., having been or gotten someone pregnant ($\Delta R^2 = .03, p < .05$), having been tested for HIV/AIDS ($\Delta R^2 = .06, p < .05$), and one activity that is believed to reduce sexual risk taking behavior, i.e., using more methods of birth control ($\Delta R^2 = .08, p < .01$).	Adolescent gender was controlled for in all hierarchical regressions but was not significant.
DiIorio, Dudley, Lehr, & Soet, 2000	1. Examine the factors (self-efficacy about the ability to communicate about safer sex, outcome expectancies regarding communication with a partner about safer sex, attitudes of sexual partner towards safer sex communication, quality of parent-adolescent general communication, occurrence of sex-based communication with parents, and frequency of condom use) believed to promote safer sex and HIV communication among U.S. college students with their sexual partners. 2. Determine the degree that safer sex communication and or HIV communication with a sexual partner are related to condom use.	1. The occurrence of sex-based communication with parents was strongly associated with the quality of general communication with parents ($r = .433, p < .01$). The occurrence of sex-based communication with parents ($r = .189, p < .001$) and quality of general communication with parents ($r = .121, p < .001$) was associated with safer sex communication with a partner. Other variables that were more strongly correlated with safer sex communication with a partner included communication self-efficacy ($r = 0.417, p < .001$), communication outcome expectancies ($r = .412, p < .001$), perception of partner's attitudes towards communication ($r = .480, p < .001$). One variable that was weakly correlated with safer sex communication with a partner than the parent variables was condom use ($r = .072, p = .008$). 2. The occurrence of sex-based communication with parents ($r = .062, p = .024$) was positively associated with condom use. However, in a fully saturated model, the occurrence of sex-based communication with parents was directly and positively associated with communication self-efficacy ($\beta = .13$) and safer sex communication with a partner ($\beta = .08$); communication self-efficacy was positively associated with communication outcome expectations ($\beta = .31$) which was positively associated with condom use ($\beta = .11$). However, the path through safer sex communication was negatively associated with condom use ($\beta = -.12$). Although no p values were given, the author stated only significant paths shown.
		Quality of parent-adolescent general communication was directly associated with communication outcome expectations ($\beta = .07$) and communication outcome expectations was directly and

Author(s) Year	Purpose(s)	Main findings
Hutchinson, 1999	1. Identify the individual, dyad, and family variables that influenced young women's risk perceptions of STDs/ HIV.	<p>positively related to condom use ($\beta = .11$). However, communication outcome expectations was also indirectly and negatively related to condom use ($\beta = -.12$) through a positive relationship with safer sex communication ($\beta = .17$).</p> <p>1.1 Parent-daughter sexual risk communication, predicted daughters' decreased perceptions of no risk for STDs/HIV/AIDS ($\beta = -0.370, p < .05$). Daughters who reported greater parent-daughter sexual risk communication about STDs and HIV/AIDS and how to protect themselves were about 30% less likely to believe that they were at no risk than daughters reporting less parent-daughter sexual risk communication.</p> <p>1.2 A model ($\chi^2 = 44.689, df = 14, p = .001$) consisting of consistent condom use during the past 5 years, mother-daughter sexual risk communication, perception of the partner as no risk for STDs/HIV, and relationship satisfaction accounted for approximately 40% of the variance in daughter's perceptions of no risk for STD/HIV infection.</p>
Hutchinson, 2002	<p>1. Examine the relationship between the timing and amounts of parent-daughter sexual risk communication and daughters' sexual risk behaviors (sex initiation, consistent condom use, and self-reported STDs).</p> <p>2. Determine if there is a moderating effect of race, ethnicity, and urbanicity on the relationship between parent-daughter sexual</p>	<p>1.1 Discussion of sex with parents prior to sex initiation ($\beta = -1.051, p < .001$) and quality of father-adolescent general communication ($\beta = -.214, p < .05$) predicted less likelihood of initiating sexual intercourse; however, the model, which also included demographic variables of African American or Hispanic race/ethnicity, and living in an urban residence, was not significant [$\chi^2 (5, N = 217) = 45.95, ns$].</p> <p>1.2 Occurrence of parental-adolescent sexual communication prior to sex initiation ($\beta = 1.903, p < .01$), mother-daughter communication about condoms ($\beta = .533, p < .01$), and quality of general communication with the mother ($\beta = .469, p < .05$) were among the predictors of consistent condom use, $\chi^2, (7, N = 134) = 42.671, p = .0001$. The other predictors were being classified as urban residents, ($\beta = 2.044, p < .01$) and father's education ($\beta = .143, p < .05$). This model explained 27.3% of the variance in consistent condom use.</p> <p>1.3 Indirect effects of on-time parent adolescent sexual risk communication were suggested. On-time parent sexual risk communication was associated with older age of sexual initiation (1.1) and consistent condom use (1.2). Predictors of the likelihood of STD occurrences, $\chi^2, (7, N = 143) = 32.01, p = .0001$, were urban residency ($\beta = 2.894, p < .05$), consistent condom use prior to age 18 ($\beta = -2.479, p < .01$), and age at first sexual intercourse ($\beta = -.431, p < .05$).</p> <p>2. No interactions were found.</p>

Author(s) Year	Purpose(s)	Main findings
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	<p>risk communication and daughters' sexual risk behaviors.</p> <ol style="list-style-type: none"> 1. Examine the association between mother-daughter sexual risk communication and selected adolescent risky sexual behaviors (number of male sexual partners during the past 3 months, number of days of sexual intercourse during the past 3 months, and number of days of intercourse without a condom during the past 3 months). 2. Identify possible mediators of the relationships between mother-daughter sexual risk communication and selected adolescent sexual risk behaviors. 	<ol style="list-style-type: none"> 1. Occurrence of mother-daughter sexual risk communication predicted less numbers of sexual partners ($\beta = -.07, p < .06$). Mother-daughter sexual risk communication predicted fewer episodes of sexual intercourse ($\beta = -.12, p < .05$) and less number of days of unprotected sexual intercourse ($\beta = -.22, p < .05$). Mother-daughter sexual risk communication about condoms had a stronger negative correlation with the occurrence of unprotected intercourse ($r = -.17, p < .02$) than any other communication variable. Mother-daughter sexual risk communication about sexual intercourse was negatively correlated with the instances of sexual intercourse ($r = -.19, p = .01$). Three communication topics (ever discussed birth control, ever discussed AIDS, and ever discussed condoms) were negatively associated with number of sexual partners (only the p value was reported for these three associations; $p < .05$). 2. Mother-daughter sexual risk communication demonstrated a negative direct and indirect effect on number of days of unprotected sexual intercourse at the 3-month follow-up. Mother-daughter sexual risk communication demonstrated a direct effect on the number of days of unprotected sexual intercourse ($\beta = -.19, p = .01$), and an indirect effect through mediation of condom use self-efficacy at baseline ($\beta = -.22, p < .01$).
Hutchinson & Montgomery, 2007	<ol style="list-style-type: none"> 1. Examine the influence of parent-adolescent sexual risk communication on the sexual risk attitudes, beliefs, and behaviors of the sample. 	<ol style="list-style-type: none"> 1. The amount of mother-adolescent sexual risk communication was associated with daughter's and son's: <ol style="list-style-type: none"> 1.1. Attitude toward unmarried adolescent sexual intercourse ($r = -.130$). 1.2. Attitude toward engaging in sex during the next 3 months ($r = -.176, p < .01$). 1.3. Belief about difficulty talking to partner about sexual topics ($r = -.117, p < .01$). 1.4. Belief that parent's opinion is important ($r = .210, p < .01$) 1.5. Being sexually active during the past 3 months ($r = -.184, p < .01$). 1.6. Having unprotected sex in past 3 months ($r = -.167, p < .05$, with daughters only). 1.7. Ever having been/made someone pregnant ($r = -.143, p < .01$, with daughters only). Daughters who reported high levels of mother-adolescent sexual risk communication were 62% less likely to report ever having been pregnant. <p>The amount of father-adolescent sexual risk communication was associated with daughter's and son's:</p> <ol style="list-style-type: none"> 1.8. Attitude toward unmarried adolescent sexual intercourse ($r = -.128, p < .01$, with daughters

Author(s) Year	Purpose(s)	Main findings
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008	<ol style="list-style-type: none"> 1. Examine the associations between role status change (living arrangements, student status, education plans, employment status, and parenthood) during the transition to adulthood and risky sexual risk behaviors specific to African Americans (condom use frequency, occurrence of sex with someone that might be infected with HIV, frequency of alcohol or drug use before engaging in sex, frequency during the last 12 months of sexual intercourse, sex without any birth control, sex without a condom, and sex with a person the adolescent did not know well). 2. Explore the mediation of substance use and peer affiliation on the relationship between role statuses and high-risk sexual behavior. 3. Explore the moderating influences family processes (satisfying relationships with parents, communication about risk behavior, and clear parental norms that discourage such behavior) and religiosity (religious beliefs and church attendance) on the relationship of role statuses on high-risk sexual behavior and mediators of role statuses and high-risk sexual behavior. 	<p>only),</p> <ol style="list-style-type: none"> 1.9. Attitude toward engaging in sex during the next 3 months ($r = -.114, p < .08$, with daughters only), 1.10. Attitude toward using condoms in the next 3 months ($r = .130, p < .05$, with daughters only). 1.11. Belief about difficulty talking to partner about sexual topics ($r = -.206, p < .05$, with sons only). 1.12. Belief that parent's opinion is important ($r = .372, p < .01$) 1.13. Being sexually active during the past 3 months ($r = -.118, p < .01$). <ol style="list-style-type: none"> 1. The study factors, $\chi^2 = 5.50(11), p = .9, \chi^2/df = 0.5, CFI = 1.0, R^2 = .16$, that predicted adolescent's sexual risk behavior were intent to attend school within the next year, being employed part-time vs. full-time, living in a dorm or barracks vs. alone or with peers, and being a parent. 2. Substance use fully mediated the influence of part-time versus full-time employment on high-risk sexual behavior, $\chi^2 = 34.589(22), p = .043, \chi^2/df = 1.57, CFI = .95$, Peer affiliations partially mediated the relationship between parenthood status and high-risk sexual behavior. 3. Two groups of factors improved model fit with significant changes in chi-square. Both protective family processes ($\Delta\chi^2 = 5.11, p = .024$), including communication about risk behavior, and high religiosity ($\Delta\chi^2 = 4.98, p = .026$) moderated the effect of parenthood status on high-risk sexual behavior. High religiosity moderated the effect of substance use ($\Delta\chi^2 = 3.99, p = .046$) on high-risk sexual behavior.

Author(s) Year	Purpose(s)	Main findings
Lehr, DiIorio, Dudley, & Lipana, 2000	1. Explore associations between selected demographics and parent-adolescent sex communication with age of sexual intercourse initiation and consistent condom use.	<p>1. The amount of sex-related communication with mothers was higher than with fathers [$F(1,730) = 269.53, p < .001$]. A trend was evident of daughters reporting higher amounts of sex-related communication than sons did, $F(1,730) = 3.49, p = .06$, qualified by a parent-by-participant gender interaction, $F(1,730) = 111.77, p < .001$. The total score for mother sex-related communication was considerably higher than for father sex-related communication (2.24 vs. 1.47). Daughters rated mother sex-related communication considerably higher than father sex-related communication (2.56 vs. 1.30) and sons' ratings were also higher for mother sex-related communication than father sex-related communication, but was also closer together (1.91 vs. 1.63).</p> <p>2. Gender was the strongest predictor of consistent condom use, $\chi^2 = 14.2065, df = 1; p = .0002$, with sons more likely to report consistent condom use than daughters. African American daughters who reported more mother-adolescent sex communication were more likely, $\chi^2 = 13.1009, df = 2; p = .0143$, to use condoms consistently.</p> <p>3. Openness of sex communication with mother was rated higher than openness of communication with father, $F(1,730) = 74.98, p < .001$. Overall levels of openness of communication with parents was slightly higher for sons than for daughters, $F(1,730) = 4.13, p = .042$, accounted for through a gender-by-parent interaction, $F(1,730) = 62.01, p < .001$. Daughters reported considerably higher levels of openness with their mothers than with fathers (3.05 vs. 2.31) while sons reported about the same level of openness with their mothers and fathers (2.86 vs. 2.82). White participants who reported more and less openness with mother, $\chi^2 = 11.8436, df = 2; p = .0161$, were more likely to have initiated sex before 18-years of age and African American participants who reported more openness with father, $\chi^2 = 11.3072, df = 2; p = .0210$, were more likely to have initiated sex before 18-years of age.</p>

APPENDIX A - TABLE 2

Parent-Adolescent Sexual Risk Communication Studies: Methods

Author(s) Year	Design	Theoretical/ Conceptual framework	Sample description
Bynum, 2007	Predictive correlational	Ecological theory (Bandura, 1986, 1997)	Convenience sample of 75 African American female college freshmen (median age = 18 years) and their mothers, recruited from two sites. Thirty-six pairs of daughters/mothers were from a private, selective historically Black college/university and 39 pairs of daughters/mothers were from a selective, public, primarily White institution.
Clawson & Reese-Weber, 2003	Predictive correlational	None stated	Convenience sample of 214 college students between the ages of 18 and 21 years (47% male, 53% female; 82.2% White, 9.3% African American, 5.6% Hispanic, and 1.9% Asian).
DiIorio et al., 2000	Model-testing correlational	Conceptual model based on empirical findings and the social cognitive framework (Bronfenbrenner, 1989)	Random sample of 1,349 students between the ages of 18 and 25 years recruited from six colleges and universities (37% male, 63% female; 50.5% White, 42.3% African American, and 7.2% other).
Hutchinson, 1999	Predictive correlational	Conceptual model based on model of human ecology (Parse, 1992) and theory of human becoming (Hutchinson, Sosa, & Thompson, 2001)	<p>Convenience sample of 93 females between the ages of 17 and 26 years consisted of two sub-samples.</p> <p>Sub-sample 1: Sixty-six females between the ages of 20 and 26 years recruited from a study of young adults' relationships with their parents (97% White, 3% Hispanic/Latina).</p> <p>Sub-sample 2: Twenty-seven females between the ages of 17 and 22 years recruited from a university and the surrounding community (92.6% White, 3.7% Asian, and 3.7% African American).</p>

Author(s) Year	Design	Theoretical/ Conceptual framework	Sample description
Hutchinson, 2002	Descriptive and predictive correlational	None stated	<p>Random sample of 234 female licensed drivers (born in 1976, between the ages of 19 and 21 years). The sample was 39% White, 33% African American, and 28% Hispanic-Latina.</p> <p>Additional random samples were obtained targeting African American and Latina women in order to minimize the effects of the initial difficulty in locating original sample candidates. This sample was used in a previous analysis (Ajzen, 1985, 1991; Bandura, 1986).</p>
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	Quasi-experimental	Theory of Planned Behavior and Social Cognitive Theory (Hutchinson & Wood, 2007).	Random sample, stratified by age, of 219 female adolescents between the ages of 12 and 19 years recruited from an inner-city adolescent medicine clinic (68% African American and 32% Hispanic/Latina).
Hutchinson & Montgomery, 2007	Correlational and methodological	Parent-Based Expansion of the Theory of Planned Behavior (Bandura, 1997)	Convenience sample of 488 African American college students (M age = 18.13 years, SD = 1.09). The sample was 34.4% male and 65.6% female.
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008	Model-testing correlational	Heuristic Conceptual Model based on three models/theories: emerging adulthood conceptual model, social developmental theory, and theories of life-course development.	Random selections of African American families with fifth grade students, which was used to draw a sample of 186 older siblings for this study. Older siblings were between the ages of 18 and 21 years (M age = 19.11, SD = .86). The sample was 45.2% male and 54.8% female.
Lehr, DiIorio, Dudley, & Lipana, 2000	Methodological with descriptive correlational and predictive elements	None stated Note: Other studies from this research team have used social cognitive theory (Burns & Grove, 2005)	Convenience sample of 732 college students between the ages of 18 and 25 years (39% male, 61% female; 50.8% White and 49.2% African American).

Note. Design types (Fox & Inazu, 1980)

APPENDIX A - TABLE 3

Parent-Adolescent Sexual Risk Communication Measures: Descriptions

Study	Measure employed	# Items	Response format	Participants	Focus	Internal Consistency Reliability (α)
Bynum, 2007	<u>Mothers' Communication About Sexual Topics</u> (Fisher, 1987)	7	4-point "never" to "frequently, several times a month during childhood"	Mothers	Frequency of mother-daughter sexual risk communication	Mother-daughter = .83
Clawson & Reese-Weber, 2003	<u>Weighted Topics Measure</u> (Wills, Gibbons, Gerrard, Murry, & Brc 2003)	9	5-point "none" to "a lot"	Sons and daughters	Amount of mother- and father- sexual risk communication with their daughters and sons	Mother-adolescent = .88 Father-adolescent = .91
	<u>Timing of Parent-Adolescent Sexual Discussions</u> Item added by researchers to Fischer's Weighter Topics Measure above, to assess age of first discussion of sexual intercourse.	1	Open ended question asking age of first sexual intercourse discussion	Sons and daughters	Timing of mother- and father- sexual risk communication with their daughters and sons	N/A Coded as on-time or off- time
DiIorio, Dudley, Lehr, & Soet, 2000	<u>Sex-Based Communication With Parents</u>	5	Dichotomous "yes" or "no"	Sons and daughters	Occurrence of parent-daughter and son sexual risk communication	Parent-adolescent = .83
Hutchinson, 1999	<u>Parent-Teen Sexual Risk Communication Scale</u>	3	5-point "none" to "extensive"	Daughters	Amount of parent-daughter sexual risk communication	Parent-daughter = .82

Study	Measure employed	# Items	Response format	Participants	Focus	Internal Consistency Reliability (α)
Hutchinson, 2002	<u>Parent-Teen Sexual Risk Communication Scale-III</u>	8	5-point “nothing/none” to “extensive/ everything”	Daughters	Amount of mother-daughter and father-daughter sexual risk communication	Mother-daughter = .92 Father-daughter = .95
	<u>Timing of Parent-Adolescent Sexual Risk Communication</u>	1	Dichotomous “yes” or “no”	Daughters	Timing of mother-daughter and father-daughter sexual risk communication	N/A
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	<u>Mother-Daughter Sexual Risk Communication</u>	5	Dichotomous “yes” or “no”	Daughters	Occurrence of mother-daughter sexual risk communication	Mother-daughter = .86
Hutchinson & Montgomery, 2007	<u>Parent-Teen Sexual Risk Communication Scale-III</u> (8 items formed the sexual risk scale)	15	5-point “none” to “extensive”	Sons and daughters	Amount of mother- and father- sexual risk communication with their daughters and sons	Mother-adolescent = .91 Father-adolescent = .86
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008	<u>Parent-Child Communication</u> (Hovell, Sipan, Blumberg, Atkins, & Hofstetter, 1994)	3	4-point “never” to “many times”	Sons and daughters	Frequency of parent-daughter and parent-son sexual risk communication	Parent-adolescent = .93
Lehr, DiIorio, Dudley, & Lipana, 2000	<u>Sex-Related Communication Scale</u>	10	6-point “none” to “a lot”	Sons and daughters	Amount of mother- and father- sexual risk communication with their daughters and sons	Mother-adolescent = .92 Father-adolescent = .93
	<u>Openess of Sexual Communicaton Scale</u>	4	5-point “agree” to “disagree”	Sons and daughters	Openess of mother- and father- sexual risk communicaiton with daughters and sons	Mother-adolescent = .84 Father-adolescent = .85

APPENDIX A - TABLE 4

Parent-Adolescent Sexual Risk Communication Measures: Topics Assessed

Study	Topics assessed by the parent-adolescent sexual risk communication measure						
	Sexual Intercourse	Birth Control	Pregnancy	Disease & Pregnancy Protection	STDs	HIV/AIDS	Additional Topics
Bynum, 2007	X	X	X	X			Fertilization, menstruation, dating
Clawson & Reese-Weber, 2003	X	X	X		X		Fertilization, menstruation, abortion, prostitution, homosexuality
DiIorio, Dudley, Lehr, & Soet, 2000	X		X	X	X	X	No additional topics addressed
Hutchinson, 1999				X	X		Methods of resisting sexual pressure
Hutchinson, 2002		X		X	X	X	Postponing or not having sex, pressure from boys to have sex, how to resist pressure from boys to have sex
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	X	X			X	X	Condoms
Hutchinson & Montgomery, 2007		X		X	X	X	Condoms, postponing or not having sex, peer and partner pressure to have sex, how to handle

Study	Topics assessed by the parent-adolescent sexual risk communication measure						sexual pressure
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008	X	X			X		No additional topics addressed
Lehr, DiIorio, Dudley, & Lipana, 2000	X		X	X	X	X	Alcohol use

APPENDIX A - TABLE 5

Sexual Risk Measures: Descriptions

Study	Measure employed	# Items	Response format	Participants	Focus	Internal Consistency Reliability (α)
Bynum, 2007	<u>Sexual Activity Scale</u> (CDC, 1998) Revised by adding two items.	11	Ordinal scale with the higher score reflecting a greater level of sexual experience	Daughters	Occurrence of sexual activity	Original scale adolescent = .96 None reported for revised scale
Clawson & Reese-Weber, 2003	<u>Sexual Risk Taking portion of the 1998 National College Health Risk Behavior Survey</u> (US, 1988)	6	Mix of dichotomous, Likert scale, and ordinal responses	Sons and daughters	Occurrence of sexual risk behaviors	None reported
DiIorio, Dudley, Lehr, & Soet, 2000	<u>Condom Use</u>	1	5-point responses ranged from "never" to "every time"	Sons and daughters	Occurrence of condom use	None reported
	<u>Safer Sex Communication sub-scale of the Safe Sex Behavior Questionnaire</u> (Deci & Ryan, 1985b; Ryan, Deci et al., 1995)	7	4-point responses ranged from "never" to "always"		Occurrence of safer sex communication	Adolescents = .76
Hutchinson, 1999	Open Ended Question	1	Dichotomous	Daughters	Perception of STD/HIV self-risk (outcome)	None reported

Study	Measure employed	# Items	Response format	Participants	Focus	Internal Consistency Reliability (α)
	Open Ended Questions: Tested for HIV/AIDS, sexual partners, condom use frequency	3	Dichotomous, ordinal, and Likert scale with 5-point responses ranged from “almost never or never” to “almost always or always”	Daughters	Occurrence of sexual risk behaviors (predictors)	None reported
Hutchinson, 2002	Open Ended Questions: First intercourse, STD occurrence, condom use (recoded from Likert to dichotomous)	3	All dichotomous or ordinal values entered	Daughters	Occurrence of sexual risk behaviors	None reported
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	Open Ended Questions: Sexual partners, intercourse, days of unprotected sex	3	Ordinal values entered	Daughters	Occurrence of sexual risk behaviors	None reported
Hutchinson & Montgomery, 2007	Open Ended Questions: Intercourse, condom use, STDs, pregnancy	4	All dichotomous or ordinal values entered	Sons and daughters	Occurrence of sexual risk behaviors	None reported
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008	<u>High-Risk Sexual Behavior</u> Condom use frequency, sex with possible infected partner, frequency of sex with alcohol or drug use, frequency of sexual intercourse, sex without birth control, sex without a condom, and sex with a person not known well, number of lifetime sexual partners	8	First three items used a 5-point response scale ranged from “definitely not” to “definitely yes”, Next, four items used a 5-point response scales ranged from “never” to “6 or more times”, Last item was a ordinal value was logarithmically transformed	Sons and daughters	Occurrence of sexual risk behaviors	Adolescent = .84

Study	Measure employed	# Items	Response format	Participants	Focus	Internal Consistency Reliability (α)
Lehr, DiIorio, Dudley, & Lipana, 2000	Open Ended Questions: First intercourse, condom use	2	Ordinal and 5-point response scale from “never” to “always”	Sons and daughters	Occurrence of sexual risk behaviors	None reported

APPENDIX A - TABLE 6

Sexual Risk Measures: Topics Assessed

Study	Sexual activity	Age of first intercourse	Condom use	# of Sexual partners	Birth control used	Tested for HIV/AIDS	History of STD	Unprotected intercourse	History of pregnancy	Other Topics
Bynum, 2007	X									
Clawson & Reese-Weber, 2003		X	X	X	X	X			X	Gotten someone pregnant
DiIorio, Dudley, Lehr, & Soet, 2000			X							Condom use frequency Sexual history of partner, other items not available in article
Hutchinson, 1999			X*	X*		X*				Feelings of shame if infected with STDs or HIV* Perception of self-risk for STDs/HIV
Hutchinson, 2002		X	X				X			
Hutchinson Jemmott, Jemmott, Braverman, & Fong, 2003	X			X				X		

Study	Sexual activity	Age of first intercourse	Condom use	# of Sexual partners	Birth control used	Tested for HIV/AIDS	History of STD	Unprotected intercourse	History of pregnancy	Other Topics
Hutchinson & Montgomery, 2007	X		X				X		X	Ever gotten someone pregnant
Kogan, Brody, Gibbons, Murry, Cutrona, Simmons, et al., 2008			X		X					Occurrence of sex with someone that might be infected with HIV, use of alcohol or drugs prior to sex, during the past 12 months sex without any birth control, sex without a condom, and sex with a person that was not well known to the participant
Lehr, DiIorio, Dudley, & Lipana, 2000		X	X							

*These sexual behavior items were measured as predictors of perception of self-risk for STDs/HIV

APPENDIX A - TABLE 7

Autonomy Support from Parent(s) Studies: Main Findings

Author(s) Year	Purpose(s)	Main findings
Williams, Hedberg, Cox & Deci (2000)	1.1 Examine the relationship between extrinsic life goals and risky health behaviors, and perceived parental autonomy support and risky health behaviors.	<p>Study 1</p> <p>1.1 High-school smokers placed a greater value on extrinsic goals than non-smokers [$t(139) = 1.99, p < .05$].</p> <p>Study 2</p> <p>1.1 Risky behavior (alcohol use, cigarette use, marijuana use, chewing tobacco, and engagement in sexual intercourse) was associated with student's grade level ($r = .23, p < .001$), with the relative extrinsic aspiration index ($r = .21, p < .001$), with father's education ($r = -.13, p < .01$), and with parental autonomy support ($r = -.23, p < .001$). Specifically, the relationship statistics between the risk-behavior variable and parental autonomy support were alcohol use, $r = -.16, p < .01$; cigarette use, $r = -.23, p < .001$; marijuana use, $r = -.15, p < .01$; chewing tobacco use, $z = -1.7, p < .10, ns$; sexual intercourse, $z = -2.8, p < .01$.</p> <p>1.2 Fathers' education was positively associated with perceived parental autonomy support, ($r = -.28, p < .001$) and with relative extrinsic aspirations of their children ($r = -.13, p < .01$). Non-whites perceived less autonomy support from their parents than Whites did [$t(292) = 3.0, p < .01$] and had higher extrinsic aspirations, $t(284) = 2.90, p < .01$. Parental autonomy support was negatively associated with relative extrinsic aspirations, ($r = -.26, p < .001$).</p> <p>1.3 The final model, $F(3,267) = 12.8, p < .001$; $R^2 = .13$, examining adolescent risk behaviors revealed that adolescent health-risk behaviors were predicted positively by grade level, ($\beta = .18, p < .001$), relative extrinsic aspirations, ($\beta = .18, p < .01$), and negatively by parental autonomy support, ($\beta = -.19, p < .01$).</p>
Wong (2008)	<p>1. Examine the relationship of parental involvement and parental autonomy support to academic performance, classroom disruptive behavior, and substance use.</p> <p>2. Test the mediation affect of academic self-regulatory styles and effortful control.</p>	<p>1. Parental involvement and autonomy support were positively correlated, ($r = .36, p < .05$). Self-regulation variables (identified regulation, attention, inhibitory control, activation control) were positively correlated with one another, $p < .05$. Parental autonomy support and identified regulation, and attention were positively related. Parental autonomy support had a negative relationship with alcohol use. Identified regulation was negatively associated with disruptive behavior and alcohol and cigarette use.</p> <p>2. A model of parental involvement, parental autonomy support, effortful control, identified regulation, and academic performance, $\chi^2(459) = 499.34, p = .09, CFI = .97, TLI = .97, RMSEA = .02$] explained 39% of the variance in academic performance. Parental autonomy support ($\beta = .34, p < .01$) predicted identified regulation ($\beta = .28, p < .001$) which predicted academic performance.</p>

Author(s) Year	Purpose(s)	Main findings
3.	Examine the relationship of parenting characteristics, effortful control, academic self-regulatory style, and outcome in high risk and low risk students.	<p>3. A model of parental involvement, parental autonomy support, effortful control, identified regulation and disruptive behavior in the classroom, $\chi^2 (517) = 542.10, p = .21, CFI = .99, TLI = .98, RMSEA = .02$, explained 37% of the variance in disruptive behavior. Parental autonomy support ($\beta = .31, p < .01$) predicted identified regulation ($\beta = -.50, p < .001$) which predicted disrupted behavior in the classroom.</p> <p>A model of parental involvement, parental autonomy support, effortful control, identified regulation, disruptive behavior in the classroom, and substance use, $\chi^2 (643) = 678.36, p = .16, CFI = .98, TLI = .98, RMSEA = .02$, explained 15% of the variance in substance use. There was a strong positive relationship ($\beta = .38, p < .001$) between disruptive behavior and substance use among high-risk students. High-risk students were defined by having at least one parent who could not speak English well, and having at least one parent who did not have an education past high school.</p>

APPENDIX A - TABLE 8

Autonomy Support from Parent(s) Studies: Methods

Author(s) Year	Design	Theoretical/ Conceptual framework	Sample description
Williams, Cox, Hedberg, & Deci (2000)	Correlational	Self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995)	The hypotheses were tested using two convenience samples. Study 1: 141 high school students between the ages of 14 and 18 years. The 48% male and 52% female sample was 87% White and 13% Non-White. Study 2: 271 high school students. The 47% male and 53% female sample was 81% White and 14% Non-White. No age information was reported in this study.
Wong (2008)	Model-testing correlational	Self-determination theory (Burns & Grove, 2005) (Implied)	Convenience sample included 171 middle and high school students ($M = 14.05$ years, $SD = 1.46$). The 42% male and 58% female sample was 56.8% White, 35.8% Hispanic, 3.4% Native American, 0.6% African American, and 3.4% other.

Note. Design types (Deci & Ryan, 1985b; Ryan, Deci et al., 1995)

APPENDIX A - TABLE 9

Adolescent Autonomous Motivation Studies: Main Findings

Author(s) Year	Purpose(s)	Main findings
Neighbors, Walker, & Larimer (2002)	1. Evaluate self-determination as a moderator between male and female college students' 1) alcohol expectancies and alcohol consumption, 2) alcohol expectancies and negative consequences, 3) evaluations of alcohol effects and alcohol consumption, 4) evaluations of alcohol effects and negative consequences, and evaluate 5) if moderation effects would be more obvious among males than females.	<p>1.1 The relationship between positive alcohol expectations and alcohol consumption was stronger among students who reported lower autonomy orientations ($t = -1.95, 495 df, p = .05$). For males only, the relationship between positive alcohol expectations and alcohol consumption was stronger among students who reported more controlled orientations ($t = 1.96, 178 df, p = .05$).</p> <p>1.2 The relationship between positive alcohol expectations and negative consequences was greater among those students who reported lower autonomy orientations ($t = -2.06, 509 df, p < .05$). Among females, positive alcohol expectations were related to more negative consequences regardless of the level of controlled orientation. Males reported the relationship between positive alcohol expectations and negative consequences were stronger among male students who reported higher in controlled orientation ($t = 1.99, 177 df, p < .05$).</p> <p>1.3 The relationship between favorable evaluations of alcohol effects and alcohol consumption was stronger among students who reported lower autonomy orientations ($t = -2.07, 490 df, p < .05$). Among male students, the relationship between favorable evaluations of alcohol effects and alcohol consumption was stronger among males who were higher in controlled orientation ($t = 3.13, 176 df, p < .01$).</p> <p>1.4 The relationship between evaluations of positive alcohol effects was stronger among students who reported lower autonomy orientations ($t = -1.88, 505 df, p = .06$), but did not reach significance.</p>
Williams, Cox, Kouides, & Deci (1999)	1. Test an autonomy supportive intervention to not smoke among adolescents, and to validate the instruments of perceived autonomy support and autonomous motivation for not smoking.	<p>Study 1</p> <p>1. High school students perceived that the <i>choice presentation</i> was more autonomy supportive than the <i>fear and demand presentation</i>, $\beta = .16, F(1, 151) = 4.09, p = .04$.</p> <p>Study 2</p> <p>1.1 High school students perceived the <i>choice presentation</i> was more autonomy supportive than the <i>fear and demand presentation</i>, $\beta = .34, F(1, 239) = 32.5, p < .001$.</p> <p>1.2 The students' perceptions of the presenters' autonomy supportiveness did increase the students' autonomous motivation to not smoke from time 1 to time 2, $\beta = .11, F(1, 194) = 6.13, p = .01$. In addition, the students' perceptions of the presenters' autonomy supportiveness did increase the students' autonomous motivation to not smoke from baseline to follow-up $\beta = -.22, F(1, 155) = 7.64, p = .006$, and during that same period, $\beta = -.26, F(1, 188) = 21.3, p < .001$.</p>

APPENDIX A – TABLE 10

Adolescent Autonomous Motivation Studies: Methods

Author(s) Year	Design	Theoretical/ Conceptual framework	Sample description
Neighbors, Walker, & Larimer (2002)	Correlational	Self-determination theory (Deci & Ryan, 1985b; Ryan, Deci et al., 1995)	Convenience sample consisted of 560 college students (<i>M</i> age = 19.24 years, <i>SD</i> = 1.77 years). The 38% male and 62% female sample was 58.7% White, 34.1% Asian/Asian American, and 7.2% other ethnicity.
Williams, Cox, Kouides, & Deci (1999)	Quasi-experimental	Self-determination theory (Burns & Grove, 2005)	<p>Study 1 Convenience sample consisted of 154 high school students (<i>M</i> age = 16.1 years, <i>SD</i> = 0.86). The 48.1% male and 51.9% female sample was 13% minority.</p> <p>Study 2 Convenience sample consisted of 229 high school students, from the 9th-12th grades. The intervention group consisted of 42% male and 58% female participants and the control group was 44% male and 56% female. Both groups were comprised of a 15% minority population. No age information was reported in this study.</p>

Note. Design types

APPENDIX B - DATA COLLECTION SITES – SUPPORT LETTER TEMPLATE

APPENDIX B - DATA COLLECTION SITES – SUPPORT LETTER TEMPLATE

Letterhead of Facility

October 22, 2009

University of Alabama at Birmingham
Institutional Review Board
Room 470, Administration Building (AB)
701 20th Street South
Birmingham, AL 35294-0104

To Whom It May Concern:

My name is XXXXXX and I am a XXXXXX. I have been contacted by Ms. Bettina H. Riley regarding the recruitment of UAB students 19- to 20 years-of-age during the 2009-2010 academic year for her dissertation research.

Specifically, I have granted permission to Ms. Riley to come to our campus at the XXXXXX during normal operating hours on predetermined places, dates, and times for the recruitment and data collection for her dissertation study. Once she receives UAB IRB approval, she may schedule specific dates and times. Please feel free to contact me if you have any questions.

Sincerely,

XXXXXX

APPENDIX C - IRB APPROVALS

APPENDIX C – 1 - ORIGINAL IRB APPROVAL



Form 4: IRB Approval Form Identification and Certification of Research Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on October 26, 2010. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines.

Principal Investigator: RILEY, BETTINA H

Co-Investigator(s):

Protocol Number: **X091222022**

Protocol Title: *Parental Influences on Late Adolescents' Autonomous Motivation and Sexual Risk Knowledge and Behavior*

The IRB reviewed and approved the above named project on 1/5/10. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 1-5-10

Date IRB Approval Issued: 1/5/10

Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104

APPENDIX C – 2 -RENEWAL #1 IRB APPROVAL



Form 4: IRB Approval Form Identification and Certification of Research Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on September 29, 2013. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.


Principal Investigator: RILEY, BETTINA H
Co-Investigator(s):
Protocol Number: **X091222022**
Protocol Title: *Parental Influences on Late Adolescents' Autonomous Motivation and Sexual Risk Knowledge and Behavior*

The IRB reviewed and approved the above named project on 12-29-10. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 12-29-10

Date IRB Approval Issued: 12-29-10


Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104

APPENDIX D - FLYER

APPENDIX D - FLYER

A DOCTORAL STUDENT FROM THE UNIVERSITY OF ALABAMA AT BIRMINGHAM SCHOOL OF NURSING IS SEEKING TO EXAMINE PARENTAL INFLUENCES ON THEIR SONS' AND DAUGHTERS' SEXUAL RISK KNOWLEDGE AND BEHAVIOR.

You are eligible to participate if you meet all of the following requirements:

1. You are 19 or 20 years old
2. You are unmarried
3. You are not a parent
4. You speak and read English
5. You have been enrolled during this academic year at this institution

When: Now or within the period listed on the collection box.

Where: Here at the XXXXXXXXXX

How: Ask the researcher for a questionnaire packet and then complete it.

Do I have to participate? NO. Participation is strictly voluntary. This survey is completely CONFIDENTIAL and ANONYMOUS. Do not put your name anywhere on the survey documents. *Participation in this study will not influence student status or grades.*

Will I be paid? All participants will receive a \$5.00 Gift Card when the survey is placed in the collection box.

How much time will be involved? 15-20 minutes

Researcher Information

Bettina H. Riley, BSN, RN

**UAB School of Nursing
1701 University Blvd.
Birmingham, AL 35294**

Phone [REDACTED]
[REDACTED]

APPENDIX E - COVER LETTER FOR QUESTIONNAIRE PACKET

APPENDIX E - COVER LETTER FOR QUESTIONNAIRE PACKET

Bettina H. Riley
UAB School of Nursing
1701 University Blvd.
Birmingham, AL 35294
Email address: [REDACTED]

December 1, 2009

Re: Protocol No. X091222022

Dear Participant:

My name is Bettina H. Riley. I am a doctoral candidate from the UAB School of Nursing conducting my dissertation research study. In order to be eligible for this study you should be between the ages of 19 and 20 years, unmarried, not a parent, speak and read English, and have been enrolled during this academic year at the institution we are at today.

This study is about parental influences on their sons' and daughters' sexual risk knowledge and behavior. This study has been developed so you can tell us what you do that may affect your sexual health. The information you give will be used to develop better sexual health education for young people like yourself. This survey should take you about 15 - 20 minutes to complete. Do not write your name on this survey. The answers you give will be kept private. No one will know what your answers on this survey are. Answer the questions based on your experiences.

Completing the survey is voluntary. You may choose not to be in the study or you may withdraw (stop) from the study at any time before it is over. This will not affect your student status or grades at this institution. You will not be offered or receive any special consideration if you take part in this research. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. This information will not be used to find out your name. No names will be known.

If you agree to participate, your consent will be conveyed by completing the questionnaire. The potential risks in participating in this study are minimal. You may experience some possible discomfort from answering sensitive questions about sexual communication, behavior, or knowledge. You can stop filling out this survey if you

experience any emotional distress during the process. You can leave blank any answer to any question you do not want to answer. By completing this survey and submitting your responses, you are agreeing to allow me to use your answers in a research study.

You will be placed in a private area so you can complete this survey. I have given you a blank envelope to place the completed survey in and you can deposit it in the container. Do not put your name on the survey or envelope. When you deposit the envelope in the container, I will give you a \$5 Gift Card for your efforts.

Please make sure to read every question and answer honestly. I am available to answer questions about completion of this survey. You may keep this letter or return it for recycling.

If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact Ms. Sheila Moore. Ms. Moore is the Director of the Office of the Institutional Review Board for Human Use (OIRB) at the University of Alabama at Birmingham (UAB). Ms. Moore may be reached at [REDACTED]. If calling the toll -free number, press the option for “all other calls” or for an operator/attendant and ask for extension [REDACTED]. Regular hours for the Office of the IRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Thank you for your help!

APPENDIX F - QUESTIONNAIRE PACKETS

APPENDIX F-1 - Original Questionnaire Packet

Section I. - Demographics

Please circle the correct answer or fill in the blank.

1. **What is your gender?** Female <001> Male <002>

2. **What is your age?** _____ Yrs.

3. **Is your mother living?** Yes <001> No <002>
 - a) **If alive, what is your mother's age?** _____ Yrs.

4. **Is your father living?** Yes <001> No <002>
 - b) **If alive, what is your father's age?** _____ Yrs.

5. **What is your race/ethnicity?**

African-American / Black <001>

Asian / Pacific Islander <002>

Caucasian / White <003>

Hispanic/Latino <004>

Native American <005>

Multi-Racial <006>

Other _____

 Please describe <007>

6. **Your current residence.**

Live with parents Yes <001> No <002>

7. Mother's Education Level. Please circle the highest level achieved.

Less than 7th Grade <001>

Junior high school (9th grade) <002>

Partial high school (10th or 11th grade) <003>

High School graduate (whether private preparatory, parochial, trade, or public school) <004>

Partial college (at least one year) or specialized training <005>

Standard college or university graduation <006>

Graduate professional training (graduate degree) <007>

8. Father's Education Level. Please circle the highest level achieved.

Less than 7th Grade <001>

Junior high school (9th grade) <002>

Partial high school (10th or 11th grade) <003>

High School graduate (whether private preparatory, parochial, trade, or public school) <004>

Partial college (at least one year) or specialized training <005>

Standard college or university graduation <006>

Graduate professional training (graduate degree) <007>

9. What is your parent(s) current occupation? If retired, list occupation prior to retirement.

Mother _____
Please describe

Father _____
Please describe

10. What is your biological parent(s) marital status?

Parents married and living together _____ <001>

Parents are separated or divorced _____ <002>

Only one parent is living _____ <003>

Both parents are deceased _____ <004>

11. Are you currently enrolled in school?

Yes <001> No <002> **(If no, go to Section II – on the next page)**

Please describe.

How many years of schooling have you completed at this program/college?
_____ Yrs.

What percent (%) of your studies in this program/college have you completed this
for? _____ %

Please proceed to the Section II – on the next page.

Section II. – Questionnaires

Mother-Teen Sexual Communication

Instructions: These questions ask about how much information your mother may or may not have given you about certain sexual topics when you were a teen (10- to 18-years-old). Mother refers to your mother, stepmother, or other mother figure. If you do not have a mother figure please skip to Question #22.

Please answer as honestly as possible. The term sexuality includes sexual intercourse.
Circle your response.

1. In general, how much information did your mother share with you about human sexuality?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

2. More specifically, how much information did she give you about puberty and how your body changes (boys) or menstruation (girls)?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

3. How much did she tell you about reproduction/how babies are made?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

4. How much information did she give you about contraception/preventing pregnancy?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

5. How much information did she give you about sexually transmitted diseases?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

6. How much did she tell you about HIV/AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

7. How much information did she give you about ways to protect yourself from getting sexually transmitted diseases or AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

8. How much did your mother tell you about condoms specifically?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

9. How often did she talk with you about waiting until you are older or not having sex?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All Of The Time<005>

10. How much did she tell you about her own past sexual behaviors and experiences?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

11. How much did she tell you about peer pressure and sexual pressure from dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

12. How much did she tell you about how to resist pressure from peers and dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

13. How often did she talk with you about not drinking alcohol and using drugs?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

14. How much did she tell you about how to resist pressure from peers and dating partners to use alcohol and drugs?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

15. How often did your mother talk with you about how alcohol and drugs could impair your judgment and lead you to take risks you wouldn't otherwise take?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

16. When you were between the ages of 10 and 18, how close were you to your mother?

Not Close At All <001> Somewhat Close <002> Quite Close <003> Extremely Close <004>

17. How easy or difficult was it to remember the amount of sexual communication you had with your mother?

Very Easy <001> Somewhat Easy <002> Somewhat Difficult <003> Very Difficult <004>

***PTSRC-III (Parent-Teen Sexual Risk Communication Scale – Version 3)
Copyright 1999***

18. My mother figure described above is my ...

Biological Mother<001> Stepmother<002>

Other<003>

Please describe

Instructions: Sexual risk topics include topics about behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS. **Sexual risk topics** can include having sex 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and 4) after drinking alcohol or using drugs. With this definition in mind, please answer the following questions. **Please circle the correct answer.**

19. Did your mother discuss sexual risk topics (see above) prior to age 13?

Yes <001> No <002>

20. Did your mother discuss sexual risk topics (see above) because of you wanting to discuss sexual risk topics?

Yes <001> No <002>

21. Did your mother discuss sexual risk topics (see above) because of your mother believing/feeling that you had started having sexual intercourse?

Yes <001> No <002>

Father-Teen Sexual Communication

Instructions: These questions ask about how much information your father may or may not have given you about certain sexual topics when you were a teen (10- to 18-years-of-age). These questions are similar to questions we asked about communication with your mother. Father may refer to your father, stepfather, or other father figure. If you do not have a father figure please skip to Question #43.

Please answer as honestly as possible. The term sexuality includes sexual intercourse.
Circle your response.

22. In general, how much information did your father share with you about human sexuality?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

23. More specifically, how much information did he give you about puberty and how your body changes (boys) or menstruation (girls)?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

24. How much did he tell you about reproduction/how babies are made?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

25. How much information did he give you about contraception/preventing pregnancy?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

26. How much information did he give you about sexually transmitted diseases?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

27. How much did he tell you about HIV/AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

28. How much information did he give you about ways to protect yourself from getting sexually transmitted diseases or AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

29. How much did your father tell you about condoms specifically?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

30. How often did he talk with you about waiting until you are older or not having sex?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

31. How much did he tell you about his own past sexual behaviors and experiences?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

32. How much did he tell you about peer pressure and sexual pressure from dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

33. How much did he tell you about how to resist pressure from peers and dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

34. How often did he talk with you about not drinking alcohol and using drugs?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

35. How much did he tell you about how to resist pressure from peers and dating partners to use alcohol and drugs?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

36. How often did your father talk with you about how alcohol and drugs could impair your judgment and lead you to take risks you wouldn't otherwise take?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

37. When you were between the ages of 10 and 18, how close were you to your father?

Not Close At All <001> Somewhat Close <002> Quite Close <003> Extremely Close <004>

38. How easy or difficult was it to remember the amount of sexual communication you had with your father?

Very Easy <001> Somewhat Easy <002> Somewhat Difficult <003> Very Difficult <004>

***PTSRC-III (Parent-Teen Sexual Risk Communication Scale – Version 3)
Copyright 1999***

39. MY FATHER FIGURE DESCRIBED ABOVE IS MY ...

Biological Father<001> Stepfather<002> Other<003>

Please describe

Instructions: Sexual risk topics include topics about behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS. **Sexual risk topics** can include having sex 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and 4) after drinking alcohol or using drugs. With this definition in mind, please answer the following questions. **Please circle the correct answer.**

40. Did your father discuss sexual risk topics (see above) prior to age 13?

Yes <001> No <002>

41. Did your father discuss sexual risk topics (see above) because of you wanting to discuss sexual risk topics?

Yes <001> No <002>

42. Did your father discuss sexual risk topics (see above) because of your father believing/feeling that you had started having sexual intercourse?

Yes <001> No <002>

Perceptions of Parents Scale

Instructions: Please answer the following questions about your mother and your father. Mother refers to your mother, stepmother, or other mother figure. If you do not have a mother figure please skip to Question #53.

Using the 7-point scales below, **please circle the number** that represents the extent to which each statement is true for you.

First, questions about your mother.

43. My mother seems to know how I feel about things.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

44. My mother tries to tell me how to run my life.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

45. My mother, whenever possible, allows me to choose what to do.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

46. My mother listens to my opinion or perspective when I've got a problem.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

47. My mother allows me to decide things for myself.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

48. My mother insists upon my doing things her way.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

49. My mother is usually willing to consider things from my point of view.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

50. My mother helps me to choose my own direction.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

51. My mother isn't very sensitive to many of my needs.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

52. My mother figure described above is my ...

Biological Mother<001> Stepmother<002> Other<003>

 Please describe

Now, questions about your father. Father may refer to your father, stepfather, or other father figure. If you do not have a father figure please skip to Question #63.

53. My father seems to know how I feel about thing/s.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

54. My father tries to tell me how to run my life.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

55. My father, whenever possible, allows me to choose what to do.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

56. My father listens to my opinion or perspective when I've got a problem.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

57. My father allows me to decide things for myself.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

58. My father insists upon my doing things his way.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

59. My father is usually willing to consider things from my point of view.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

60. My father helps me to choose my own direction.

1 2 3 4 5 6 7
Not At All True Somewhat True Very True

61. My father isn't very sensitive to many of my needs.

1 2 3 4 5 6 7
Not At All True Somewhat True Very True

62. My father figure described above is my ...

Biological Father<001> Stepfather<002> Other<003>

Please describe

TSRQ - Healthy Sexual Behavior

Instructions: The following questions relate to the reasons why you would not engage in sexual risk behavior. Sexual risk behaviors are those behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS. Sexual risk behavior can include having sex 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and/or 4) after drinking alcohol or using drugs. Different people have different reasons for not engaging in sexual risk behavior and we want to know **how true** each of the following reasons is for you. **Sex** is defined as oral, anal, or vaginal intercourse.

Using the 7-point scales below and **circle the number** that represents the extent to which each statement is true for you.

63. The reason I would *not engage in sexual risk behavior* is because I feel that I want to take responsibility for my own health.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

64. The reason I would *not engage in sexual risk behavior* is because I would feel guilty or ashamed of myself if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

65. The reason I would *not engage in sexual risk behavior* is because I personally believe it is the best thing for my health.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

66. The reason I would *not engage in sexual risk behavior* is because others would be upset with me if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

67. I really don't think about the reason I would *not engage in sexual risk behavior*.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

68. The reason I would *not engage in sexual risk behavior* is because I have carefully thought about it and believe it is very important for many aspects of my life.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

69. The reason I would *not engage in sexual risk behavior* is because I would feel bad about myself if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

70. The reason I would *not engage in sexual risk behavior* is because it is an important choice I really want to make.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

71. The reason I would *not engage in sexual risk behavior* is because I feel pressure from others to not engage in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

72. The reason I would *not engage in sexual risk behavior* is because it is easier to do what I am told than think about it.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

73. The reason I would *not engage in sexual risk behavior* is because it is consistent with my life goals.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

74. The reason I would *not engage in sexual risk behavior* is because I want others to approve of me.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

75. The reason I would *not engage in sexual risk behavior* is because it is very important for being as healthy as possible.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

76. The reason I would *not engage in sexual risk behavior* is because I want others to see I can do it.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

77. I don't really know what the reason is I would *not engage in sexual risk behavior*.

1 2 3 4 5 6 7
 Not At All True Somewhat True Very True

The Sexually Transmitted Disease Knowledge Questionnaire

Instructions: For each statement below, please **circle the correct answer**.
If you don't know, please do not guess; instead, please circle Don't Know.

- | | | | | |
|------------|---|------|-------|------------|
| 78. | Genital Herpes is caused by the same virus as HIV. | True | False | Don't Know |
| 79. | Frequent urinary infections can cause Chlamydia. | True | False | Don't Know |
| 80. | There is a cure for Gonorrhea. | True | False | Don't Know |
| 81. | It is easier to get HIV if a person has another Sexually Transmitted Disease. | True | False | Don't Know |
| 82. | Human Papillomavirus (HPV) is caused by the same virus that causes HIV. | True | False | Don't Know |
| 83. | Having anal sex increases a person's risk of getting Hepatitis B. | True | False | Don't Know |
| 84. | Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina). | True | False | Don't Know |
| 85. | There is a cure for Chlamydia. | True | False | Don't Know |
| 86. | A woman who has Genital Herpes can pass the infection to her baby during childbirth. | True | False | Don't Know |
| 87. | A woman can look at her body and tell if she has Gonorrhea. | True | False | Don't Know |
| 88. | The same virus causes all of the Sexually Transmitted Diseases. | True | False | Don't Know |
| 89. | Human Papillomavirus (HPV) can cause Genital Warts. | True | False | Don't Know |
| 90. | Using a natural skin (lambskin) condom can protect a person from getting HIV. | True | False | Don't Know |

- | | | | | |
|-------------|--|------|-------|------------|
| 91. | Human Papillomavirus (HPV) can lead to cancer in women. | True | False | Don't Know |
| 92. | A man must have vaginal sex to get Genital Warts. | True | False | Don't Know |
| 93. | Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women. | True | False | Don't Know |
| 94. | A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina. | True | False | Don't Know |
| 95. | If a person tests positive for HIV the test can tell how sick the person will become. | True | False | Don't Know |
| 96. | There is a vaccine available to prevent a person from getting Gonorrhea. | True | False | Don't Know |
| 97. | A woman can tell by the way her body feels if she has a Sexually Transmitted Disease. | True | False | Don't Know |
| 98. | A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner. | True | False | Don't Know |
| 99. | There is a vaccine that prevents a person from getting Chlamydia. | True | False | Don't Know |
| 100. | A man can tell by the way his body feels if he has Hepatitis B. | True | False | Don't Know |
| 101. | If a person had Gonorrhea in the past he or she is immune (protected) from getting it again. | True | False | Don't Know |
| 102. | Human Papillomavirus (HPV) can cause HIV. | True | False | Don't Know |
| 103. | A man can protect himself from getting Genital Warts by washing his genitals after sex. | True | False | Don't Know |
| 104. | There is a vaccine that can protect a person from getting Hepatitis B. | True | False | Don't Know |

Sexual Behavior Inventory

Many people are embarrassed about answering sexual behavior questions. Please be assured these questions are designed to help understand how to prevent transmission of sexual disease. There is no intention to embarrass. Your answers cannot be traced to you or any individual.

Instructions: Please answer the following questions about your own sexual behavior. Please respond as honestly as you can. Sex is further defined as oral, anal, or vaginal intercourse. **Circle the correct answer.**

105. Do you use alcohol or drugs during sex? Yes <001> No <002>
106. Do you ever have sex without a condom? Yes <001> No <002>
107. I am sure I could talk to my partner about safer sex. Yes <001> No <002>
108. Have you ever had anal intercourse? Yes <001> No <002>
109. I am sure we would use condoms even if I were upset or feeling bad. Yes <001> No <002>
110. Have you ever had a sexual transmitted disease? (e.g. syphilis, gonorrhea) Yes <001> No <002>
111. I am sure we would use condoms even if I have been using alcohol or drugs. Yes <001> No <002>
112. Have you ever been pregnant or a father? Yes <001> No <002>
113. I am sure we would use condoms even if my partner doesn't want to use condoms. Yes <001> No <002>

Please fill in the blanks.

114. How many times have you had sex in the past year? _____ # of times
If zero proceed to question 123.

115. How many times have you had sex in the past year *without* a condom? _____ # of times

116. How many times have you had sex in the past year *without* protection against pregnancy?
_____ # of times _____ Not applicable

117. How many sex partners have you had in the past year? _____ # of different partners

118. How many sex partners during the past year were you in a steady relationship with?
_____ # of different partners _____ Not applicable

119. On how many occasions did your sex partner in the past year influence you to have sex without protection against pregnancy?
_____ # of occasions _____ Not applicable

120. On how many occasions in the past year did your sex partner influence you to have sex without protection against disease transmission (i.e., condoms)?
_____ # of occasions _____ Not applicable

Instructions: Please circle the correct answer when describing *your* sexual experiences during the last 12 months. Intercourse refers to oral, anal, or penile/vaginal.

121. Have you had intercourse with a male who may have had intercourse with another male?

Yes <001>

No <002>

122. Have you had intercourse with a partner who may have used intravenous drugs?

Yes <001>

No <002>

APPENDIX F-2 - REVISED QUESTIONNAIRE PACKET

Section I. - Demographics

Please circle the correct answer or fill in the blank.

1. **What is your gender?** Female <001> Male <002>

2. **What is your age?** _____ Yrs.

3. **Is your mother living?** Yes <001> No <002>

c) **If alive, what is your mother's age?** _____ Yrs.

4. **Is your father living?** Yes <001> No <002>

d) **If alive, what is your father's age?** _____ Yrs.

5. **What is your race/ethnicity?**

African-American / Black <001>

Asian / Pacific Islander <002>

Caucasian / White <003>

Hispanic/Latino <004>

Native American <005>

Multi-Racial <006>

Other _____

Please describe <007>

6. **Your current residence.**

Live with parents Yes <001> No <002>

7. Mother's Education Level. Please circle the highest level achieved.

Less than 7th Grade <001>

Junior high school (9th grade) <002>

Partial high school (10th or 11th grade) <003>

High School graduate (whether private preparatory, parochial, trade, or public school) <004>

Partial college (at least one year) or specialized training <005>

Standard college or university graduation <006>

Graduate professional training (graduate degree) <007>

8. Father's Education Level. Please circle the highest level achieved.

Less than 7th Grade <001>

Junior high school (9th grade) <002>

Partial high school (10th or 11th grade) <003>

High School graduate (whether private preparatory, parochial, trade, or public school) <004>

Partial college (at least one year) or specialized training <005>

Standard college or university graduation <006>

Graduate professional training (graduate degree) <007>

**9. What is your parent(s) current occupation?
If your mother or father do not work please list specifics (i.e., retired, homemaker, incarcerated, N/A if deceased). If retired, please list occupation prior to retirement.**

Mother _____
Please describe

Father _____
Please describe

10. What is your biological parent(s) marital status?

- Parents married and living together _____ <001>
- Parents are separated or divorced _____ <002>
- Only one parent is living _____ <003>
- Both parents are deceased _____ <004>

10. Have you been enrolled, during this academic year, at the institution we are at today?

- Yes <001>
- No <002>

Please proceed to the Section II – on the next page.

Section II. – Questionnaires

Mother-Teen Sexual Communication

Instructions: These questions ask about how much information your mother may or may not have given you about certain sexual topics when you were a teen (10- to 18-years-old). Mother refers to your mother, stepmother, or other mother figure. If you do not have a mother figure please skip to Question #22.

Please answer as honestly as possible. The term sexuality includes sex/sexual intercourse. Sex/sexual intercourse is further defined as oral, anal, or penile/vaginal intercourse.

Circle your response.

1. In general, how much information did your mother share with you about human sexuality?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

2. More specifically, how much information did she give you about puberty and how your body changes (boys) or menstruation (girls)?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

3. How much did she tell you about reproduction/how babies are made?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

4. How much information did she give you about contraception/preventing pregnancy?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

5. How much information did she give you about sexually transmitted diseases?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

6. How much did she tell you about HIV/AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

7. How much information did she give you about ways to protect yourself from getting sexually transmitted diseases or AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

8. How much did your mother tell you about condoms specifically?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

9. How often did she talk with you about waiting until you are older or not having sex?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All Of The Time<005>

10. How much did she tell you about her own past sexual behaviors and experiences?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

11. How much did she tell you about peer pressure and sexual pressure from dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

12. How much did she tell you about how to resist pressure from peers and dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

13. How often did she talk with you about not drinking alcohol and using drugs?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

14. How much did she tell you about how to resist pressure from peers and dating partners to use alcohol and drugs?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

15. How often did your mother talk with you about how alcohol and drugs could impair your judgment and lead you to take risks you wouldn't otherwise take?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

16. When you were between the ages of 10 and 18, how close were you to your mother?

Not Close At All <001> Somewhat Close <002> Quite Close <003> Extremely Close <004>

17. How easy or difficult was it to remember the amount of sexual communication you had with your mother?

Very Easy <001> Somewhat Easy <002> Somewhat Difficult <003> Very Difficult <004>

PTSRC-III (Parent-Teen Sexual Risk Communication Scale – Version 3)
Copyright 1999

18. My mother figure described above is my ...

Biological Mother<001> Stepmother<002>

Other<003>

Please describe

Instructions: Sexual risk topics include topics about behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS.

Sexual risk topics can include having sex/sexual intercourse 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and 4) after drinking alcohol or using drugs. Sex/sexual intercourse is further defined as oral, anal, or penile/vaginal intercourse. With this definition in mind, please answer the following questions.

Please circle the correct answer.

19. Did your mother discuss sexual risk topics (see above) prior to age 13?

Yes <001> No <002>

20. Did your mother discuss sexual risk topics (see above) because of you wanting to discuss sexual risk topics?

Yes <001> No <002>

21. Did your mother discuss sexual risk topics (see above) because of your mother believing/feeling that you had started having sexual intercourse?

Yes <001> No <002>

Father-Teen Sexual Communication

Instructions: These questions ask about how much information your father may or may not have given you about certain sexual topics when you were a teen (10- to 18-years-of-age). These questions are similar to questions we asked about communication with your mother. Father may refer to your father, stepfather, or other father figure. If you do not have a father figure please skip to Question #43.

Please answer as honestly as possible. The term sexuality includes sex/sexual intercourse. Sex/sexual intercourse is further defined as oral, anal, or penile/vaginal intercourse.

Circle your response.

22. In general, how much information did your father share with you about human sexuality?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

23. More specifically, how much information did he give you about puberty and how your body changes (boys) or menstruation (girls)?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

24. How much did he tell you about reproduction/how babies are made?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

25. How much information did he give you about contraception/preventing pregnancy?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

26. How much information did he give you about sexually transmitted diseases?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

27. How much did he tell you about HIV/AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

28. How much information did he give you about ways to protect yourself from getting sexually transmitted diseases or AIDS?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

29. How much did your father tell you about condoms specifically?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

30. How often did he talk with you about waiting until you are older or not having sex?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

31. How much did he tell you about his own past sexual behaviors and experiences?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

32. How much did he tell you about peer pressure and sexual pressure from dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

33. How much did he tell you about how to resist pressure from peers and dating partners?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

34. How often did he talk with you about not drinking alcohol and using drugs?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

35. How much did he tell you about how to resist pressure from peers and dating partners to use alcohol and drugs?

None <001> Very Little <002> Some <003> A Lot <004> Everything <005>

36. How often did your father talk with you about how alcohol and drugs could impair your judgment and lead you to take risks you wouldn't otherwise take?

Never <001> Rarely (Once Or Twice) <002> Occasionally <003> Often <004> All of the Time<005>

37. When you were between the ages of 10 and 18, how close were you to your father?

Not Close At All <001> Somewhat Close <002> Quite Close <003> Extremely Close <004>

38. How easy or difficult was it to remember the amount of sexual communication you had with your father?

Very Easy <001> Somewhat Easy <002> Somewhat Difficult <003> Very Difficult <004>

***PTSRC-III (Parent-Teen Sexual Risk Communication Scale – Version 3)
Copyright 1999***

39. MY FATHER FIGURE DESCRIBED ABOVE IS MY ...

Biological Father<001> Stepfather<002> Other<003>

Please describe

Instructions: Sexual risk topics include topics about behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS. **Sexual risk topics** can include having sex/sexual intercourse 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and 4) after drinking alcohol or using drugs. Sex/sexual intercourse is further defined as oral, anal, or penile/vaginal intercourse. With this definition in mind, please answer the following questions.

Please circle the correct answer.

40. Did your father discuss sexual risk topics (see above) prior to age 13?

Yes <001> No <002>

41. Did your father discuss sexual risk topics (see above) because of you wanting to discuss sexual risk topics?

Yes <001> No <002>

42. Did your father discuss sexual risk topics (see above) because of your father believing/feeling that you had started having sexual intercourse?

Yes <001> No <002>

Perceptions of Parents Scale

Instructions: Please answer the following questions about your mother and your father. Mother refers to your mother, stepmother, or other mother figure. If you do not have a mother figure please skip to Question #53

Using the 7-point scales below, **please circle the number** that represents the extent to which each statement is true for you.

First, questions about your mother.

43. My mother seems to know how I feel about things.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

44. My mother tries to tell me how to run my life.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

45. My mother, whenever possible, allows me to choose what to do.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

46. My mother listens to my opinion or perspective when I've got a problem.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

47. My mother allows me to decide things for myself.

1	2	3	4	5	6	7
Not At All True		Somewhat True			Very True	

48. My mother insists upon my doing things her way.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

49. My mother is usually willing to consider things from my point of view.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

50. My mother helps me to choose my own direction.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

51. My mother isn't very sensitive to many of my needs.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

52. My mother figure described above is my ...

Biological Mother<001> Stepmother<002> Other<003>

Please describe

Now, questions about your father. Father may refer to your father, stepfather, or other father figure. If you do not have a father figure please skip to Question #63.

53. My father seems to know how I feel about thing/s.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

54. My father tries to tell me how to run my life.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

55. My father, whenever possible, allows me to choose what to do.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

56. My father listens to my opinion or perspective when I've got a problem.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

57. My father allows me to decide things for myself.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

58. My father insists upon my doing things his way.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

59. My father is usually willing to consider things from my point of view.

1	2	3	4	5	6	7
Not At All True		Somewhat True				Very True

60. My father helps me to choose my own direction.

1 2 3 4 5 6 7
Not At All True Somewhat True Very True

61. My father isn't very sensitive to many of my needs.

1 2 3 4 5 6 7
Not At All True Somewhat True Very True

62. My father figure described above is my ...

Biological Father<001> Stepfather<002> Other<003> _____
Please describe

TSRQ - Healthy Sexual Behavior

Instructions: The following questions relate to the reasons why you would not engage in sexual risk behavior. Sexual risk behaviors are those behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV/AIDS.

Sexual risk behavior can include having sex 1) with several persons, 2) while not practicing birth control, 3) while not using condoms, and/or 4) after drinking alcohol or using drugs. Different people have different reasons for not engaging in sexual risk behavior and we want to know **how true** each of the following reasons is for you.

Sex/Sexual intercourse is defined as oral, anal, or penile/vaginal intercourse.

Using the 7-point scales below and **circle the number** that represents the extent to which each statement is true for you.

63. The reason I would *not engage in sexual risk behavior* is because I feel that I want to take responsibility for my own health.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

64. The reason I would *not engage in sexual risk behavior* is because I would feel guilty or ashamed of myself if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

65. The reason I would *not engage in sexual risk behavior* is because I personally believe it is the best thing for my health.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

66. The reason I would *not engage in sexual risk behavior* is because others would be upset with me if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

67. I really don't think about the reason I would *not engage in sexual risk behavior*.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

68. The reason I would *not engage in sexual risk behavior* is because I have carefully thought about it and believe it is very important for many aspects of my life.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

69. The reason I would *not engage in sexual risk behavior* is because I would feel bad about myself if I engaged in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

70. The reason I would *not engage in sexual risk behavior* is because it is an important choice I really want to make.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

71. The reason I would *not engage in sexual risk behavior* is because I feel pressure from others to not engage in sexual risk behavior.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

72. The reason I would *not engage in sexual risk behavior* is because it is easier to do what I am told than think about it.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

73. The reason I would *not engage in sexual risk behavior* is because it is consistent with my life goals.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

74. The reason I would *not engage in sexual risk behavior* is because I want others to approve of me.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

75. The reason I would *not engage in sexual risk behavior* is because it is very important for being as healthy as possible.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

76. The reason I would *not engage in sexual risk behavior* is because I want others to see I can do it.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

77. I don't really know what the reason is I would *not engage in sexual risk behavior*.

1	2	3	4	5	6	7
Not At All True			Somewhat True			Very True

The Sexually Transmitted Disease Knowledge Questionnaire

Instructions: For each statement below, please **circle the correct answer**.
If you don't know, please do not guess; instead, please circle Don't Know.

- | | | | | |
|------------|---|------|-------|------------|
| 78. | Genital Herpes is caused by the same virus as HIV. | True | False | Don't Know |
| 79. | Frequent urinary infections can cause Chlamydia. | True | False | Don't Know |
| 80. | There is a cure for Gonorrhea. | True | False | Don't Know |
| 81. | It is easier to get HIV if a person has another Sexually Transmitted Disease. | True | False | Don't Know |
| 82. | Human Papillomavirus (HPV) is caused by the same virus that causes HIV. | True | False | Don't Know |
| 83. | Having anal sex increases a person's risk of getting Hepatitis B. | True | False | Don't Know |
| 84. | Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina). | True | False | Don't Know |
| 85. | There is a cure for Chlamydia. | True | False | Don't Know |
| 86. | A woman who has Genital Herpes can pass the infection to her baby during childbirth. | True | False | Don't Know |
| 87. | A woman can look at her body and tell if she has Gonorrhea. | True | False | Don't Know |
| 88. | The same virus causes all of the Sexually Transmitted Diseases. | True | False | Don't Know |
| 89. | Human Papillomavirus (HPV) can cause Genital Warts. | True | False | Don't Know |
| 90. | Using a natural skin (lambskin) condom can protect a person from getting HIV. | True | False | Don't Know |

- | | | | | |
|-------------|--|------|-------|------------|
| 91. | Human Papillomavirus (HPV) can lead to cancer in women. | True | False | Don't Know |
| 92. | A man must have vaginal sex to get Genital Warts. | True | False | Don't Know |
| 93. | Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women. | True | False | Don't Know |
| 94. | A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina. | True | False | Don't Know |
| 95. | If a person tests positive for HIV the test can tell how sick the person will become. | True | False | Don't Know |
| 96. | There is a vaccine available to prevent a person from getting Gonorrhea. | True | False | Don't Know |
| 97. | A woman can tell by the way her body feels if she has a Sexually Transmitted Disease. | True | False | Don't Know |
| 98. | A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner. | True | False | Don't Know |
| 99. | There is a vaccine that prevents a person from getting Chlamydia. | True | False | Don't Know |
| 100. | A man can tell by the way his body feels if he has Hepatitis B. | True | False | Don't Know |
| 101. | If a person had Gonorrhea in the past he or she is immune (protected) from getting it again. | True | False | Don't Know |
| 102. | Human Papillomavirus (HPV) can cause HIV. | True | False | Don't Know |
| 103. | A man can protect himself from getting Genital Warts by washing his genitals after sex. | True | False | Don't Know |
| 104. | There is a vaccine that can protect a person from getting Hepatitis B. | True | False | Don't Know |

Sexual Behavior Inventory

Many people are embarrassed about answering sexual behavior questions. Please be assured these questions are designed to help understand how to prevent transmission of sexual disease. There is no intention to embarrass. Your answers cannot be traced to you or any individual.

Instructions: Please answer the following questions about your own sexual behavior. Please respond as honestly as you can. Sex/sexual intercourse is further defined as oral, anal, or penile/vaginal intercourse. **Circle the correct answer.**

105. Have you ever had sexual intercourse? Yes <001> No <002>

If the answer to question 105 is Yes - Please continue with the questions below, starting with question 106.

If the answer to question 105 is No - You have completed this questionnaire, please place this questionnaire in the envelope and deposit the envelope in the collection box. Thank you!

106. Do you use alcohol or drugs during sex? Yes <001> No <002>

107. Do you ever have sex without a condom? Yes <001> No <002>

108. I am sure I could talk to my partner about safer sex. Yes <001> No <002>

109. Have you ever had anal intercourse? Yes <001> No <002>

110. I am sure we would use condoms even if I were upset or feeling bad. Yes <001> No <002>

111. Have you ever had a sexual transmitted disease? (e.g. syphilis, gonorrhea) Yes <001> No <002>

112. I am sure we would use condoms even if I have been using alcohol or drugs. Yes <001> No <002>

113. Have you ever been pregnant or a father? Yes <001> No <002>

114. I am sure we would use condoms even if my partner doesn't want to use condoms. Yes <001> No <002>

Please fill in the blanks.

115. How many times have you had sexual intercourse in the past year?

_____ # of times

If the answer to question 115 is zero – You have completed this questionnaire, please place this questionnaire in the envelope and deposit the envelope in the collection box. Thank you!

If the answer to question 115 is any number other than zero - Please proceed to question 116.

116. How many times have you had sexual intercourse in the past year *without* a condom?

_____ # of times

117. How many times have you had sexual intercourse in the past year *without* protection against pregnancy?

_____ # of times

118. How many sexual intercourse partners have you had in the past year?

_____ # of different sexual partners

119. How many sexual intercourse partners, during the past year, were you in a steady relationship with?

_____ # of different sexual partners

120. On how many occasions did your sexual intercourse partner in the past year, influence you to have sex without protection against pregnancy?

_____ # of occasions

121. On how many occasions in the past year did your sexual intercourse partner influence you to have sex without protection against disease transmission (i.e., condoms)?

_____ # of occasions

Instructions: Please circle the correct answer when describing *your* sexual experiences during the last 12 months. Sex/sexual intercourse refers to oral, anal, or penile/vaginal intercourse.

122. Have you had sexual intercourse with a male who may have had sexual intercourse with another male?

Yes <001>

No <002>

123. Have you had sexual intercourse with a partner who may have used intravenous drugs?

Yes <001>

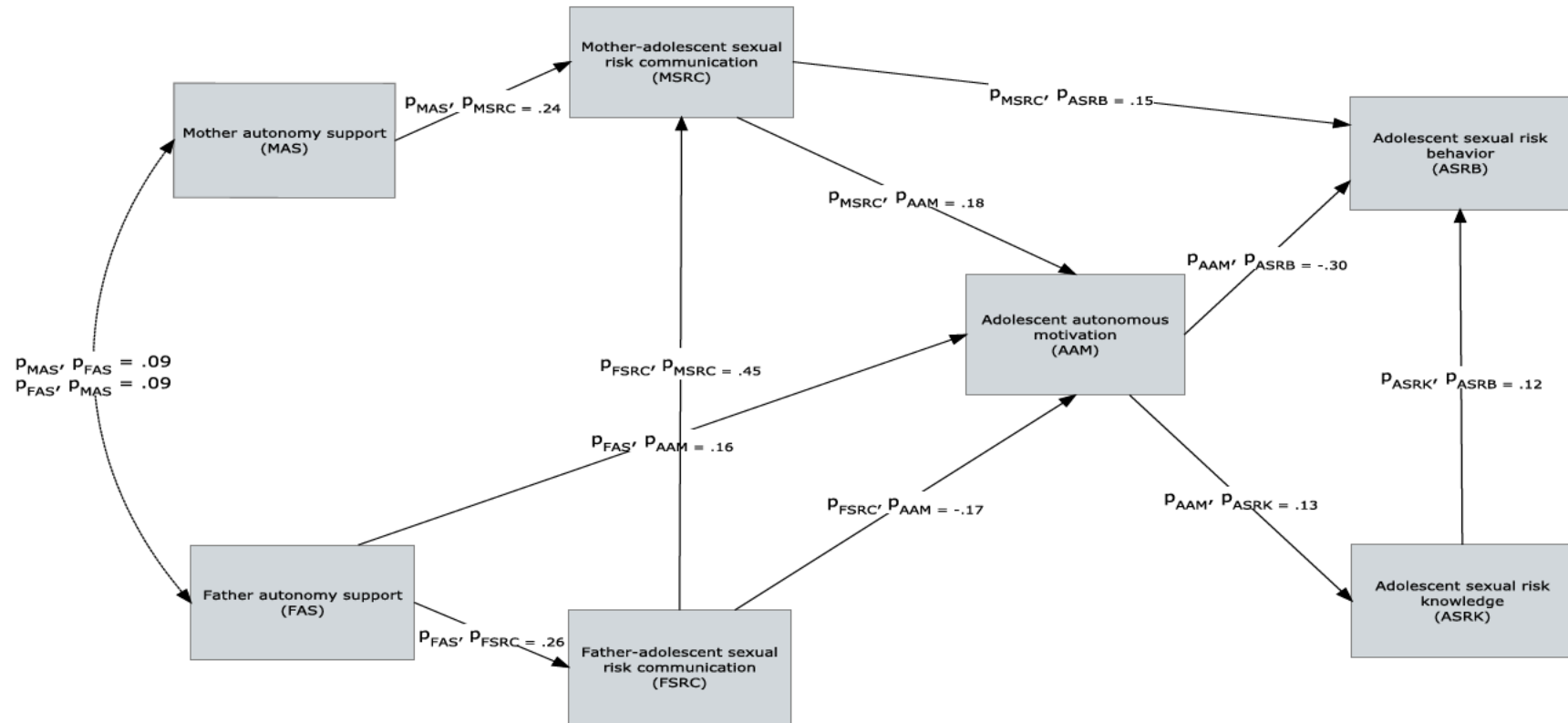
No <002>

Thank you for completing this questionnaire! You may stop here.

Please place this questionnaire in the envelope attached and deposit the envelope in the collection box.

APPENDIX G - TRIMMED MODEL OF STANDARDIZED SOLUTIONS

APPENDIX G - TRIMMED MODEL OF STANDARDIZED SOLUTIONS



Note. All simple paths are direct and significant. p_{MAS} - Path from/to Mother Autonomy Support, p_{MSRC} - Path from/to Mother Sexual Risk Communication, p_{FAS} - Path from/to Father Autonomy Support, p_{FSRC} - Path from/to Father Sexual Risk Communication, p_{AAM} - Path from/to Adolescent Autonomy Motivation, p_{ASRK} - Path from/to Adolescent Sexual Risk Knowledge, p_{ASRB} - Path from/to Adolescent Sexual Risk Behavior

**APPENDIX H - STANDARDIZED DIRECT EFFECTS, INDIRECT EFFECTS, AND TOTAL EFFECTS ON ADOLESCENT
SEXUAL RISK BEHAVIOR**

**APPENDIX H - STANDARDIZED DIRECT EFFECTS, INDIRECT EFFECTS, AND TOTAL EFFECTS ON ADOLESCENT
SEXUAL RISK BEHAVIOR**

Independent Variable	Direct	+	Indirect	=	Total
Mother-Adolescent Sexual Risk Communication	$(p_{MSRC}, p_{ASR}) = .15$	+	$(p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(.18 \times -.30) = -.054 +$ $(p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(.18 \times .13 \times .12) = .003 = -.051$	=	.10
Father-Adolescent Sexual Risk Communication	None	+	$(p_{FSRC}, p_{MSRC}) \times (p_{MSRC}, p_{ASRB})$ $(.45 \times .15) = .068 +$ $(p_{FSRC}, p_{MSRC}) \times (p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(.45 \times .18 \times -.30) = -.024 +$ $(p_{FSRC}, p_{MSRC}) \times (p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(.45 \times .18 \times .13 \times .12) = .001 +$ $(p_{FSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(-.17 \times -.30) = .051 +$ $(p_{FSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(-.17 \times .13 \times .12) = -.003 = .093$	=	.09
Mother Autonomy Support	None	+	$(p_{MAS}, p_{MSRC}) \times (p_{MSRC}, p_{ASRB})$ $(.24 \times .15) = .036 +$ $(p_{MAS}, p_{MSRC}) \times (p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB}) \times (p_{AAM}, p_{ASRB})$ $(.24 \times .18 \times -.30) = -.013 +$ $(p_{MAS}, p_{MSRC}) \times (p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(.24 \times .18 \times .13 \times .12) = .001 = .024$	=	.02
Father Autonomy Support	None	+	$(p_{FAS}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(.16 \times -.30) = -.048 +$ $(p_{FAS}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(.16 \times .13 \times .12) = .002 +$ $(p_{FAS}, p_{FSRC}) \times (p_{FSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(.26 \times -.17 \times -.30) = .013 +$ $(p_{FAS}, p_{FSRC}) \times (p_{FSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB}) \times (p_{ASRK}, p_{ASRB})$ $(.26 \times -.17 \times .13 \times .12) = -.001 +$ $(p_{FAS}, p_{FSRC}) \times (p_{FSRC}, p_{MSRC}) \times ((p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB}))$ $(.26 \times .45 \times .18 \times .13 \times .12) = .000 +$ $(p_{FAS}, p_{FSRC}) \times (p_{FSRC}, p_{MSRC}) \times (p_{MSRC}, p_{AAM}) \times (p_{AAM}, p_{ASRB})$ $(.26 \times .45 \times .18 \times -.30) = -.006 +$ $(p_{FAS}, p_{FSRC}) \times (p_{FSRC}, p_{MSRC}) \times (p_{MSRC}, p_{ASRB})$ $(.26 \times .45 \times .15) = .018 = -.022$	=	-.02
Adolescent Autonomy Motivation	$(p_{AAM}, p_{ASRB}) = -.30$	+	$(p_{AAM}, p_{ASRK}) \times (p_{ASRK}, p_{ASRB})$ $(.13 \times .12) = .016$	=	-.28
Adolescent Sexual Risk Knowledge	$(p_{ASRK}, p_{ASRB}) = .12$	+	None	=	.12

Note. p_{MAS} - Path from/to Mother Autonomy Support, p_{MSRC} - Path from/to Mother Sexual Risk Communication, p_{FAS} - Path from/to Father Autonomy Support, p_{FSRC} - Path from/to Father Sexual Risk Communication, p_{AAM} - Path from/to Adolescent Autonomy Motivation, p_{ASRK} - Path from/to Adolescent Sexual Risk Knowledge, p_{ASRB} - Path from/to Adolescent Sexual Risk Behavior