

## **ABSTRACT**

Title of Document: FOLLOWING THE LEADER: EXAMINING  
PEER INFLUENCE ON SEXUAL BEHAVIOR

Megan Bears, M.A., 2009

Directed By: Assistant Professor, Jean McGloin, Criminology  
and Criminal Justice

A number of previous studies have found that peers influence adolescent sexual behavior. Still, it remains unclear how the mechanisms of peer influence operate on the sexual behavior of adolescents. This is unfortunate because it limits theoretical clarity and inhibits the production of policy aimed at reducing adolescent sexual behavior. Using data from the National Longitudinal Study of Adolescent Health, this thesis extends upon current literature and determines the role of peer attitudes and behaviors on different forms of adolescent sexual behavior as measured by peer self-report data while addressing other limitations of previous research such as whether or not mechanisms of peer influence are conditioned by adolescent involvement with peers. The discussion of this work centers around the theoretical implications of the findings that peers do not influence all forms of sexual behavior and peer behaviors seem to be the only mechanism of peer influence that predict sexual onset.

FOLLOWING THE LEADER: EXAMINING PEER INFLUENCE  
ON SEXUAL BEHAVIOR

By

Megan Ann Bears

Thesis submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park, in partial fulfillment  
of the requirements for the degree of  
Master of Arts  
2009

Advisory Committee:  
Professor Jean M. McGloin, Chair  
Professor Ray Paternoster  
Professor Laura Dugan

© Copyright by  
Megan Ann Bears  
2009

## Dedication

To Matthew Augustyn... Thank you for all of your support and patience during the past year.

## Acknowledgements

I would like to especially thank Dr. Jean McGloin for all of her advice and guidance. You have truly helped me to become a better researcher. Also, I would like to thank Dr. Ray Paternoster and Dr. Laura Dugan for their helpful comments and advice on this thesis document.

# Table of Contents

Abstract.....	
Dedication.....	ii
Acknowledgements.....	iii
Table of Contents.....	ii
List of Tables.....	iii
List of Figures.....	iv
Chapter 1: Introduction.....	1
Chapter 2: Literature Review.....	5
The Nature of Adolescent Sexual Behavior.....	5
From "Murky" to "Mechanisms": What is known about how peer influence operates among adolescents.....	8
The Importance of Peers on the Sexual Lives of Adolescents.....	13
The Importance of Peer Involvement.....	19
Chapter 3: Current Study.....	22
Chapter 4: Data and Methods.....	23
Data.....	23
Sample Reduction.....	25
Measures.....	31
Dependent Variables.....	31
Independent Variables: Peer Attitudes and Peer Behaviors.....	33
Conditioning Variable: Peer Involvement.....	36
Control Variables for Sexual Onset and Risky Sexual Behavior Analysis.....	37
Analytic Plan.....	43
Chapter 5: Results.....	45
Extending the Sample.....	52
Additional Analyses.....	57
Chapter 6: Discussion.....	63
Limitations and Future Research.....	68
Chapter 7: Conclusion.....	72
Appendix.....	73
Bibliography.....	77

## List of Tables

Table 1a: Descriptive Statistics for Sexual Onset.....	29
Table 1b: Descriptive Statistics for Risky Sexual Behavior.....	30
Table 2: Correlation Matrix.....	46
Table 3: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset.....	48
Table 4: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside a Romantic Relationship.....	51
Table 5: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage.....	53
Table 6: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset – 1 <sup>st</sup> and 2 <sup>nd</sup> Best Friend of the Same Sex.....	55
Table 7: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside of a Romantic Relationship – 1 <sup>st</sup> and 2 <sup>nd</sup> Best Friend of the Same Sex...57	57
Table 8: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – 1 <sup>st</sup> and 2 <sup>nd</sup> Best Friend of the Same Sex.....	58
Table 9: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset – Opposite Sex Best Friend.....	60
Table 10: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside of a Romantic Relationship – Opposite Sex Best Friend.....	61
Table 11: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – Opposite Sex Best Friend.....	63
Table 12: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside of a Romantic Relationship – Re-specified Using Specific Behavior.....	73
Table 13: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – Re-specified Using Specific Behavior .....	74
Table 14: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside of a Romantic Relationship –Re-specified to General Sexual Behavior...75	75
Table 15: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – Re-specified to General Sexual Behavior .....	76

## List of Figures

Figure 1: Description of Sample Reduction.....	26
--	----

## Chapter 1: Introduction

For many youth, adolescence marks the onset of sexual activity and experimentation. Although this is a normal transition, sexual activity during adolescence can serve as a risk factor for an array of problematic behaviors. Perhaps most obviously, it can have immediate health consequences such as sexually transmitted diseases and pregnancy (Center for Disease Control [CDC], 2006; CDC, 2007). Research has also noted a linkage between risky sexual behavior and other deleterious outcomes such as delinquency (Armour & Haynie, 2006) and sexual victimization (Biglan et al., 1995; Combs-Lane & Smith, 2002; Vicary et al., 1995).

It is well documented that peers exert influence on an adolescent's sexual behavior (Bearman & Brückner, 1999; Billy et al., 1984; Hampton et al., 2005; Kinsman et al., 1998; Treboux & Busch-Rossnagel, 1995). In light of this fact, it is surprising that researchers have, for the most part, ignored *how* peers influence adolescent sexual behavior. This is unfortunate because a linkage or correlation between two variables (i.e. a respondent's involvement in sexual activity and peer involvement in sexual activity) does not necessarily represent a causal relationship, nor does it illuminate the mechanisms at work (Wikström, 2006). It is therefore imperative for research to examine the sources of peer influence in order to determine exactly how peer influence operates among teenagers. In doing so, this study can take guidance from extant literature and overcome important limitations that have hampered previous work.

Although there is ample work to speak to the importance of peer influence during adolescence, the first limitation of existing research is that it is unclear as to "what" exactly is influential in peer relationships. Taking a cue from criminological research and

theory, scholars attend to peer attitudes and peer behaviors as important mechanisms of peer influence. Most research has focused on these mechanisms independent of one another, which is problematic because it does not indicate which one is more influential nor does it control for the overlap. Therefore, theories of peer influence can benefit from research examining multiple sources of peer influence and clarify the exact impact of each mechanism on adolescent behavior. Nearly 20 years ago, Warr and Stafford (1991) studied both mechanisms of influence concurrently and found that peer behaviors are more influential than peer attitudes with regard to promoting delinquency. Unfortunately, it is hard to determine whether or not this conclusion will hold regarding peer influence on sexual behaviors since sexual activity, itself, is arguably a more private act than delinquency. Therefore, this research will seek to determine whether or not peer attitudes and peer behaviors are important mechanisms of peer influence for adolescent sexual behavior, and, if possible, whether or not the two mechanisms operate differently for sexual behaviors compared to other maladaptive behaviors such as delinquent acts which are not as private.

Second, much of the previous work regarding peer influence has studied perceptions of peer attitudes and behaviors. While perceptions of peer attitudes and behaviors may be important mechanisms of peer influence in their own right, limiting research on peer influence to perceptions is potentially problematic because these measures may be partly contaminated, tapping more into self-projections than actual peer effects (Gottfredson & Hirschi, 1990:157). This may be even more likely given that the outcome of interest is sexual behavior which is debatably a private act that is discussed and modeled less by peers. As a result, the use of respondent perceptions of peer

attitudes and behaviors is potentially troublesome given that Biglan et al. (1990) found an adolescent's perception of peer sexual behaviors is not a valid measure of a peer's actual behavior. In fact, the authors argued that adolescents report peer sexual behaviors very similar to their own in order to justify their own sexual behavior; therefore, perceptions of peer behaviors are not accurate measures of peer influence.

Two of the primary theories associated with peer influence, Differential Association Theory (Sutherland & Cressey, 1960) and Social Learning Theory (Akers, 1998) acknowledge that peer influence is partially dependent upon the intensity and frequency of peer associations. However, extant literature also largely ignores the intensity or frequency of peer interactions, which may condition peer influence. This is potentially problematic in the study of peer influence on sexual behavior because sharing sexual attitudes or behaviors may require higher levels of intimacy when compared to attitudes or behaviors in other dimensions.

This study will attempt to reconcile the aforementioned mentioned limitations of research by focusing on self-reports of peers as the measure for peer attitudes and behaviors in order to determine the nature of peer influence on sexual activity. Using the National Longitudinal Study of Adolescent Health, this study will expand upon previous research that has found peer attitudes and peer behaviors are mechanisms of peer influence on adolescent sexual behavior by reconciling the previously mentioned limitations of prior research. This is done by using self-reports of peer data in order to determine the effects of peer attitudes and peer behaviors relative to one another and

whether or not they are conditioned by peer involvement.<sup>1</sup> In the end, the findings of this study contribute to the knowledge of how peers affect the adolescent decision-making process with regard to sexual behavior and determine whether or not the amount of time that peers spend together outside of school conditions the mechanisms of peer influence.

---

<sup>1</sup> There are no studies known to this author that have directly compared both peer attitudes and peer behaviors in the same study to determine their role as sources of peer influence on adolescent sexual behavior.

## Chapter 2: Literature Review

### *The Nature of Adolescent Sexual Behavior*

Even though the stigma associated with sexual activity during adolescence is diminishing, many still see sexual activity during adolescence as maladaptive for later development (Armour & Haynie, 2007; Busseri et al., 2007; Center for Disease Control, 2006 & 2007). This has led to two distinct areas of research regarding adolescent sexual activity with two very different research agendas. The first group to conduct research on adolescent sexual behavior is the public health community in an attempt to prevent the possible deleterious outcomes that are associated with adolescent sexual behaviors. The second group of researchers who pursue the study of adolescent sexual behavior are those who argue that sexual behavior during adolescence is one of many possible manifestations of an underlying propensity to engage in risk behavior.<sup>2</sup> For instance, Gottfredson and Hirschi (1990) refer to this propensity as low self-control and argue that it leads adolescents to engage in risky behaviors such as drinking, drug use, delinquency, and risky sexual behaviors (see also Busseri et al., 2007; Paternoster & Brame, 1998). Consequently, a number of researchers have used sexual behaviors as one possible outcome measure in order to identify the causes and correlates of risky behavior during adolescence (Barnes et al., 2007; Biglan et al., 1990; Busseri et al., 2007; Guilamo-Ramos et al., 2008; Jaccard et al., 2005; Metzler et al., 1994).

---

<sup>2</sup>The argument that an underlying propensity to engage in risk behavior is a source of adolescent sexual behavior is potentially problematic for this research. However, Pratt and Cullen (2000) found that peer effects still exist when controlling for this underlying propensity (low self-control). As a result, it is still possible to accurately examine how peer influence operates among adolescents by controlling for low self-control.

Generally, research on adolescent sexual behavior focuses on one of two outcomes: the age of onset and risky sexual behavior. Research examining the onset of sexual activity focuses on antecedents in three broad categories. The first area focuses on biological changes associated with puberty that account for the onset of sexual behavior (Brooks-Gunn & Furstenburg, 1989). Second, research calls attention to the role of parents on an adolescent's transition into sexuality. This field of study has found that parents exert a statistically significant, though minimal, influence over an adolescent's decision to engage in sexual activity (Armour & Haynie, 2006; Bearman & Bruckner, 2001; Biglan et al., 1990; Henrich et al., 2006; Luster & Small, 1994; Majumdar, 2003; Metzler et al., 1994; Moore & Rosenthal, 1991; Rosenthal, Moore & Flynn, 1991). Finally, research highlights the role of peers on sexual onset and has found that peer influence is the most robust predictor of the sexual onset during adolescence (Bearman & Bruckner, 1999; Jaccard et al., 2005; Kinsman et al., 1998; Moore & Rosenthal, 1993; Woodruff, 1986). For instance, Kinsman et al. (1998) found that peers play a decisive role on an adolescent's view of sexual activity as a normative behavior during adolescence and their subsequent involvement in the behavior.

Research regarding sexuality in adolescence for the most part has focused on predictors and correlates of an adolescent's first sex, but there is also a growing literature regarding risky sexual behaviors. Traditionally, risky sexual behaviors have been defined as any sexual behavior that places a young person at a greater risk for HIV infection, other sexually transmitted diseases, and pregnancy. Risky sexual behavior can include: age of first sex is below 13; multiple sexual partners; sex with strangers; infrequent condom use; sex with non-monogamous partners; sex with a partner who uses drugs; anal

sex; having a sexually transmitted disease or having sex with a person who has a sexually transmitted disease; infrequent birth control usage; and the use of alcohol or drugs during sex (Metzler et al., 1994). Regarding the connection between sexual onset and risky sexual behavior, research suggests that the same variables that lead an adolescent to engage in sex also have an effect on whether or not an adolescent engages in risky sexual behavior (Majumdar, 2003). Again, the bulk of research on risky sexual behavior focuses on what is arguably the most robust predictor, peer influence.<sup>3</sup> As an example, Metzler et al. (1994) found that “the strongest and most proximal influence on risky sexual behavior...comes from peers” (p.432) rather than parental or personal variables. This conclusion is similar to other researchers which have demonstrated analogous findings (Biglan et al. 1990; Jaccard et al. 2005, Moore & Rosenthal 1991; Whitaker & Miller 2000).

*From “Murky” to “Mechanisms”: What is known about how peer influence operates among adolescents*<sup>4</sup>

It has been shown that peers exert a strong influence over an adolescent’s sexual behavior (Bearman & Bruckner. 1999; Jaccard et al., 2005; Kinsman et al., 1998; Metzler

---

<sup>3</sup> Though sexual behavior is typically not an outcome of interest for criminologists, it is nonetheless an important and relevant outcome. For instance, Vicary et al. (1995) found that risky sexual activity during adolescence is a risk factor for date rape and sexual assault. Combs-Lane and Smith (2002) found that female victims of sexual assault, in general, report greater involvement in risky sexual behaviors compared to women who had not been victimized. However, females are not the only ones who suffer from engaging in risky sexual behaviors. Both male and female adolescents who engage in risky sexual behaviors are more likely to engage in other problem behaviors such as underage substance use and delinquency (Metzler et al., 1994), which have their own negative consequences such as addiction and imprisonment. This aligns with the findings of Armour and Haynie (2006), which conclude that risky sexual behaviors are a risk factor for future delinquency. Although this may reflect a generalized propensity toward risky behavior, it is possible that high risk sexual activity is a precursor or gateway to other maladaptive behaviors.

<sup>4</sup> Scholars have used the term “murky” to describe what is known about the nature of peer influence (Reiss, 1985; Warr, 2002). The reason for the uncertainty surrounding peer influence results from the magnitude of ways that peer influence can operate to encourage other adolescents to engage in risky behaviors. As a result, researchers have attempted to identify some of the mechanisms of peer influence (Akers & Burgess, 1998; Warr, 2002; Warr & Stafford, 1991)

et al., 1994; Moore & Rosenthal, 1993; Woodruff, 1986). The arguments of Warr (2002) regarding peer influence, which draw heavily on the prominence of peer relationships in adolescence, help to explain why peers are so influential on adolescent sexual behavior. Associations with peers are one of the many ways that adolescents begin to define themselves outside the realm of the family. This new identity is extremely important to an adolescent, and he or she relies upon the peer group in order to form this new identity and find acceptance (Warr, 2002). Moreover, adolescents are also extremely vulnerable to alternative moral viewpoints at this stage in their life and turn to peers for emotional support during this time of transition (Warr, 2002:23). Thus, peer influence is arguably at its height during the teenage years.

With regard to the mechanisms of peer influence, scholars often turn attention to learning theories. In his Differential Association Theory, Sutherland made the case that criminal behaviors are learned and that this learning takes place in intimate personal groups, which includes peers (Sutherland & Cressey, 1960). As a result of personal interactions, a person learns definitions favorable or unfavorable toward certain acts. If the number of definitions favorable toward a certain act is larger than the number of definitions unfavorable toward the same act, then the person would engage in the behavior (Sutherland & Cressey, 1960). However, Sutherland did not specifically explain what the mechanisms were that transmitted favorable and unfavorable definitions between persons. He left the “learning process unspecified, giving no clue as to what in particular would ‘all the mechanisms that are involved in...learning’ ” (Akers, 1998: 33). C.R. Jeffrey attempted to apply other learning theories to Sutherland’s ideas in order to

appease those critics of differential association who criticized the failure of the theory to specify the learning process. In doing so, Jeffrey proposed that an:

act occurs in an environment in which in the past the actor has been reinforced for behaving in this manner, and the aversive consequences attached to the behavior have been of such a nature that they do not control or prevent the response. (Jeffrey, 1965:295).

Burgess and Akers (1966) built upon this view and incorporated the principles of operant conditioning to refine and better articulate learning mechanisms that would support “acquiring” deviance from one’s peers. Akers expanded upon differential association by specifically defining “definitions” as one’s own attitudes attached to any given behavior. More importantly, Akers (1998) stated that social learning took place through the transmission of behaviors and attitudes from one person to another. Specifically, a person is more likely to learn and commit deviant behaviors when he or she differentially associates with others who commit, model, and support violations of social and legal norms (Akers, 1998: 51). Thus, the mechanisms that produce the content of what is learned in intimate personal relationships, in this case peer relationships in adolescence, are behaviors and definitions (otherwise referenced as attitudes).

Akers (1998) also expanded upon the learning process by providing the most likely situations where learning occurs: verbal and nonverbal communication; witnessing behaviors; and other forms of interaction with persons that one highly regards. The focal point of his argument is that mechanisms of peer influence precede an individual’s decision to engage in deviant behavior (Akers, 1998). In the aforementioned situations, one’s peers provide definitions favorable or unfavorable to certain behaviors, which in turn influence a person’s actions. The vocalization of an attitude by a peer or a peer

modeling a certain behavior can be seen as a signal of approval for a behavior to an individual (Akers, 1998). Testing this theory, Akers et al. (1979) found that peer associations, differential reinforcement of definitions or attitudes, and imitation account for over 50% of non-normative behaviors by adolescents. Drawing upon their analysis, these authors concluded that the principles of social learning theory could be used to explain other forms of deviant behaviors, e.g. risky sexual behaviors.

In his explanation of Social Learning Theory, Akers never stated whether or not attitudes and behaviors had to agree in order for a peer to have some influence over another peer, nor did he discuss whether attitudes or behaviors were more powerful or necessary than the other. In an attempt to fill in the gaps left by Akers, Warr and Stafford (1991) expanded upon the conclusions of Social Learning Theory and focused on these unanswered questions. Using the National Youth Survey, the authors found that both peer attitudes and peer behaviors were significant mechanisms of peer influence; however, the effect of peer attitudes was small compared to the effect of peer behaviors. Moreover, when the peer attitudes and the peer behaviors aligned, the effect of peer influence on the respondent's behavior was even greater than peer attitudes or peer behaviors alone.

Unfortunately, Warr and Stafford (1991) did not differentiate between the respondent's perception of peer attitudes and peer behaviors and actual peer attitudes and peer behaviors. For instance, Warr and Stafford (1991) used questions from NYS that began with the phrase, "My friends think," instead of directly asking friends what they think about deviant acts. As a result, their results provided further support to Fishbein and Ajzen's (1975) conclusions that perceived attitudes and behaviors of significant

others are important in shaping and individual's intention to engage in and actually perform an action (Moore & Rosenthal, 1993).<sup>5</sup> However, Warr and Stafford (1991) allowed perceived attitudes and perceived behaviors to be synonymous with actual attitudes and behaviors even though Biglan et al. (1990) argued that an adolescent's perception of peer behaviors may not be accurate. With regard to perceptions and adolescent sexual behavior, Whitley (1998) found that adolescents overestimate the level of their peers' sexual activity on surveys. Specifically, adolescents engaged in more sexual behaviors made their peer's sexual activity more comparable to their own in order to justify their sexual behavior. This taps into the argument against the validity of peer influence on behavior in social science research, as outlined Gottfredson and Hirschi (1990), which suggest that estimates of peer effects using perceptions of peer attitudes and behaviors are inaccurate. If this assertion of Whitley (1998) is true, then previous inferences about peer influence on sexual behavior are problematic as well as detrimental to the validity of learning theories, in general.

Other research has also shown that perceived peer attitudes influence an adolescent's sexual activity (Moore & Rosenthal, 1991). Unfortunately, there has not been an attempt to determine if the perceived peer attitudes reflect the actual attitudes of one's peers or if they are merely a projection of the respondent's attitudes on one's peers. The most promising course of action to rule out spuriousness associated with peer effects (Gottfredson and Hirschi, 1990) would be to separate perceptions from

---

<sup>5</sup> Whitaker and Miller (2000) also looked at survey questions beginning with "my friends think" in order to assess the impact of peer influence on condom use, one type of risky sexual behavior. The authors looked at respondent perceptions of peer attitudes and found a positive relationship between peer condom use and the respondent's present condom use. Even though their work is still supportive of the importance of peer influence on risky sexual behaviors, their work is given relatively little attention in this paper since it uses the same problematic methods of Warr and Stafford (1991), respondent perceptions instead of actual peer reports.

projections/justifications, but at this time there is no known method to do so. Due to the lack of research examining whether actual peer attitudes and a respondent's own attitudes toward sexual behaviors agree, Moore and Rosenthal (1991) have called for future research to determine whether or not actual peer attitudes and peer behaviors are sources of peer influence on sexual behavior or if it is merely perceptions of peer attitudes and behaviors that predict sexual activity. While some researchers have looked at actual peer attitudes and behaviors independently of one another, no known research has placed actual peer attitudes and actual peer behaviors in the same model to see how the two mechanisms of peer influence compare to one another. Thus, this research attempts to follow the direction of Moore and Rosenthal (1991) and fill the void in extant research regarding peer influence on sexual behaviors while addressing other limitations of peer effects research.

#### *The Importance of Peers on the Sexual Lives of Adolescents*

Research has shown that 61% of adolescents say that their sexual education comes from their friends and 73% of teenagers talk about contraception with their friends exclusively (Moore & Rosenthal, 1993). Fortunately, not all peer influence on risky sexual activity is negative. In fact, Bearman and Bruckner (1999) found that most of the peer influence exerted on sexual behavior is positive. For instance, an adolescent whose peer group, for the most part, does not engage in sex and/or has negative views toward sexual activity is more likely to delay his or her first sexual experience and refrain from risky sexual behaviors (Kinsman et al., 1998). Consequently, interactions with peers result in influential relationships that can have a positive or negative effect on an

adolescent's behavior (Billy, Rodgers & Udry, 1984; Hartup, 1996; Urberg, 1992; Warr, 2002).

When discussing peer influence on adolescent sexual activity, it is important to note that the influence of peers differs for teenagers at different stages in their sexual life. Specifically, the influence that peers have over teenager's sexual activity varies for teenagers who are on the verge of sexual activity and teenagers who are already sexually active (Majumdar, 2003). Billy and Udry (1985) found that adolescents are very selective in their friendship choices when it comes to sexual activity. Teenagers tend to select friends who are similar to themselves in terms of a virgin/non-virgin status. This is supported by the finding that adolescents who have more sexually active peers are more likely to be sexually active themselves (Miller et al., 2000; Romer et al., 1994). Among those teenagers who have never had sex, the influence of peers on the decision to have sex is more comparable to the influence of parental attitudes and religious beliefs. For those adolescents who are already sexual active, however, peer influence on sexual behaviors makes other sources of influence insignificant (Metzler et al., 1993).

Research regarding peer influence on sexual behavior has looked at both peer attitudes and peer behaviors as mechanisms of peer influence. In 1967, Reiss looked at sexual attitudes and sexual behaviors of adolescents and concluded that "sexual behavior reflects sexual attitudes rather closely...The reverse of this statement is equally true-sexual attitudes generally reflect sexual behavior rather closely" (p.121). Perhaps as a result of Reiss's conclusion, researchers have used sexual attitudes and sexual behaviors of peers interchangeably in order to measure peer influence on sexual behavior.

The most common mechanism of peer influence that researchers have used to examine peer influence on an adolescent's sexual behavior is peer involvement in the behavior.<sup>6</sup> These studies are based on the argument that peers provide behavioral models that indirectly express approval of involvement in sexual activity, which, in turn, influence a teenager's decision to engage sex and possibly risky sexual behaviors. Testing this idea, Kinsman et al. (1997) found that the sexual activities of the peer group are instrumental in determining a teenager's intent to engage in sexual behaviors as well as their actual sexual behavior.

Much of the research on sexual initiation has used perceived peer behaviors in order to determine whether or not peers exert influence on an adolescent's initial involvement in sexual activity (Hampton et al., 2005; Kinsman et al., 1998; Mirande, 1968; Treboux & Busch-Rossnagel, 1995). In fact, authors of this type of research have found that peers have a strong impact on adolescent sexual behavior. Unfortunately, this research has used cross-sectional data making it impossible to appropriately determine if peer involvement in sexual behaviors actually predicts the onset of sexual activity during adolescence or if adolescents simply chose peers whose behavior is like their own. This further speaks to the need to use longitudinal or panel data in order to draw causal inferences regarding peer influence on adolescent behavior. As a result of this limitation in previous research, authors could only conclude that recently sexually active teens perceived more peers to be non-virgins than non-sexually active teens (Hampton et al., 2005; Nahom et al., 2001). Other research has used the same method and found that perceived risky sexual behavior of peers is a significant correlate of teenage risky sexual

---

<sup>6</sup> In his Social Learning Theory, Aker's (1998; see also Akers et al. 1979) categorizes peer behavior as imitation, one of the four elements of social learning and peer influence.

behavior (Biglan et al., 1989; Garnier & Stein, 2002; Metzler et al., 1994).<sup>7</sup> This area of research has continually demonstrated that perceived peer behaviors, such as smoking, drinking, and drug use, are strong correlates and predictors of high risk sexual behavior.

Overcoming criticisms of previous research on peer influence (see Gottfredson and Hirschi, 1990), improvements in survey instrumentation have allowed more recent studies of peer influence on sexual activity to use actual peer reports of sexual behavior instead of perceptions. This is especially beneficial given that Whitley (1998) found that adolescents overestimate the level of their peers' sexual activity on surveys, making them more comparable to their own behavior. Jaccard et al. (2005) linked together respondent and nominated peer sexual behavior information in the AddHealth data in order to determine if actual peer behaviors had any influence on an adolescent's sexual onset and found small but significant peer effects on an adolescent's first sex.<sup>8</sup> Bearman and Brückner (2001) also used the AddHealth data to link peer and respondent data and found that female peers' sexual behavior increased the likelihood of a respondent's sexual debut and future pregnancy. Finally, Majumdar (2003) linked peer and respondent data in the AddHealth as well to peer effects on risky sexual behavior and concluded that a peer's risky sexual behavior significantly impacts an adolescent's future risky sexual behavior.<sup>9</sup>

---

<sup>7</sup> Biglan et al. (1990) defined risky sexual behavior as multiple sexual partners within the past year, sex with persons whom the respondent does not know well, sex with a partner who injects drugs, non-monogamous sex partners, and the frequency of sex without condoms (249). Metzler et al. (1994) used the Scale of Sexual Risk-Taking (SSRT) (Metzler et al., 1992) as their dependent variable to measure risky sexual behavior among respondents (p. 425).

<sup>8</sup> The work of Jaccard et al. (2005) is very similar to the first step of this analysis. However, the authors made no attempt to determine if actual peer attitudes had any effect on sexual onset nor did they attempt to look at the conditioning effect of peer involvement on peer influence. In addition, the authors did not examine peer influence on risky sexual behaviors.

<sup>9</sup> Majumdar (2003) used latent class analysis to create the variable of risky sexual behavior that included age of first intercourse, condom usage, number of sexual partners, acquisition of a sexually transmitted disease and sexual intercourse under the influence of alcohol or drugs (p. 7). This research will differ from that of Majumdar (2003) and look at the effect of peer behavior on specific risky sexual behaviors. This study will also test whether or not peer attitudes have an effect on risky sexual behavior and whether or not

Although less common, researchers have used peer attitudes in order to measure peer influence on adolescent sexual behaviors. This method of analysis is especially relevant to the study of peer influence on sexual behavior since adolescents do not, generally, witness their peers engaging in sexual activities due to the private nature of sexual encounters. Because sexual activity is typically private, peer attitudes are also likely to be important mechanisms of peer influence on sexual activity. In general, research on risky sexual behaviors has shown that perceived peer attitudes are influential on an adolescent's high risk sexual activity. For instance, Whitaker and Miller (2000) looked at survey questions beginning with "my friends think" in order to assess the impact of peer influence through attitudes on condom usage. The authors found a positive relationship between peer condom use and the respondent's present condom use, indicating that peer influence through perceived attitudes is a possibility. Moore and Rosenthal (1991) also tested the influence of perceived peer attitudes on an adolescent's sexual risk-taking<sup>10</sup> and found that perceived peer attitudes were directly related to the respondent's risky sexual behavior.

Even though extant research has concluded that peer attitudes influence an adolescent's sexual activity (Moore & Rosenthal, 1991), very little research has examined whether or not perceived peer attitudes reflect the actual attitudes of one's peers or if they are merely a projection of the respondent's own attitudes on one's peers. Due to the inability to differentiate between actual peer attitudes and a respondent's attitudes toward sexual behaviors, Moore and Rosenthal (1991) called for research to

---

involvement with peers conditions these mechanisms of peer influence, two questions not addressed in the work of Majumdar (2003).

<sup>10</sup> Moore and Rosenthal (1991) defined sexual risk taking as having sex with a non-romantic partner and sex (vaginal, anal, or oral) without a condom.

look at the relationship between actual peer attitudes and a respondent's sexual activity. Manning et al. (2005) examined this relationship and found that peer attitudes were highly correlated with an adolescent's non-romantic sexual activity. As a result, the authors concluded that actual peer attitudes were influential on an adolescent's sexual risk behavior (Manning et al., 2005).<sup>11</sup>

In an analysis of both peer attitudes and peer behaviors as well as their relationship with a respondent's involvement in sexual activity, Billy, Rodgers and Udry (1984) found a positive relationship between peers' sexual attitudes and behaviors and a respondents' sexual attitudes and behaviors. Consequently, it appears that both peer attitudes and peer behavior are influential on the sexual activity of an adolescent. However, the authors failed to use a longitudinal or panel design to determine if actual peer attitudes and behaviors predicted adolescent sexual activity; therefore, causal inferences cannot be made from their work.<sup>12</sup> Warr and Stafford (1991) used a longitudinal design to examine the effects peer attitudes and peer behaviors on adolescent behavior and found that perceived peer attitudes and behaviors condition one another heightening the effect of peer influence. Unfortunately, no study known to this author has put actual peer attitudes and peer behaviors in the same model to determine whether or not peer attitudes or peer behaviors have independent and possibly conditioning effects on adolescent sexual behavior. This limits the ability to accurately determine how the mechanisms of peer influence operate leading an adolescent to engage in sexual behaviors.

---

<sup>11</sup> This study builds upon the work of Manning et al. and examines if peer attitudes are still significant predictors of risky sexual behavior when controlling for peer behavior.

<sup>12</sup> The authors only looked at whether or not the respondents were sexually active and did not examine the relationship of peer variables on risky sexual behavior.

Previous research leads one to conclude that both peer attitudes and peer behaviors have an effect on adolescent sexual behavior, but it is important to think about whether or not peer attitudes and peer behaviors in concert amplify the effect of peer influence on sexual activity. Warr and Stafford (1991) found that the alignment of peer attitudes and peer behaviors intensified the effect of peer influence on delinquency, but they failed to consider all possible interactions of attitudes and behaviors and only tested whether or not favorable attitudes toward delinquency and actual involvement in delinquent behaviors increased the effect of peer influence. The authors ignored whether or not the combination of negative attitudes toward delinquent behavior and a lack of participation in delinquent behavior was a stronger predictor of an adolescent refraining from delinquent activity. It is worthwhile to improve upon the strategy of Warr and Stafford (1991) and use an interaction term to capture the complete relationship between peer attitudes and peer behavior in order to determine whether or not the agreement of peer attitudes about sex and a peer engaging in sexual behaviors intensifies the effect of peer influence on an adolescent sexual activity since it dually exposes an adolescent to the, arguably, private world of sexual activity.

#### *The Importance of Peer Involvement*

Although peer influence on risky sexual behaviors has been studied repeatedly (see Armour & Haynie, 2006; Bearman and Bruckner, 2001; Biglan et al., 1990; Henrich et al., 2006; Jaccard et al., 2005; Luster & Small, 1994; Majumdar, 2003; Metzler et al., 1994; Moore & Rosenthal, 1991; Rosenthal, Moore & Flynn, 1991; Whitaker and Miller, 2000), the varying nature of peer relationships by the amount of time spent with peers has been largely ignored in this research. Instead, the amount of time that one spends with

his or her peers or involvement has only been used as a control variable. This is unfortunate with regard to sexual activity since the amount of time that an adolescent spends with his or her peers may have a direct effect on the number of favorable definitions toward sexual behavior that can be learned passively through attitude transmission in conversation and/or imitation after learning about or witnessing a peer's involvement in sexual activity.

Returning to the concept of differential association, Sutherland argued that the "frequency, duration, priority, and intensity" of personal relationships were the most important aspects of learning. Regarding the frequency of associations, Sutherland claimed that its purpose and definition was "obvious and need no explanation" (Sutherland and Cressey, 1960:78). However, Sutherland's theory is heavily criticized for the ambiguity of the previous statement. When he expanded upon Sutherland's theory of differential association nearly 40 years later, Akers (1998) stated that "the more time (and the greater proportion of one's time) that is spent in the company of others, the more influence they will have on one's behavior" (Akers, 1998: 62). Thus, the more time that peers spend together, the more opportunity an adolescent has to learn positive attitudes and/or witness/hear about behaviors that lead to an excess of definitions favorable to sexual activity. Warr (1993) directly tested whether the amount of time an adolescent spent with his peers had an impact on peer influence. He found that peer involvement had a statistically significant effect on self-reported delinquency and concluded that the amount of time spent with peers is an important aspect of peer influence. Unfortunately, more recent research has largely ignored the findings of Warr (1993; c.f., Agnew, 1991; Haynie and Osgood, 2005; McGloin and Shermer, 2009) or only used peer involvement

as a control variable (Majumdar, 2003). As a result, the secondary goal of this research is to test what impact peer involvement has on sexual behavior and to see whether or not the mechanisms of peer influence are conditioned by peer involvement.

### **Chapter 3: Current Study**

The goal of the present research is to determine how peer influence operates regarding sexual behavior in adolescence. This study looks at two specific sources of peer influence – peer attitudes and peer behaviors - and determine whether mechanisms of peer influence are conditioned by peer involvement. Specifically, this research tests the following hypotheses:

1. Peer attitudes regarding sexual activity and peer involvement in sexual activity are predictors of adolescent sexual behavior (the onset of sexual behavior and risky sexual behavior).
2. The interaction of peer attitudes and peer behaviors predicts adolescent sexual behavior (the onset of sexual behavior and risky sexual behavior).
3. The effects of peer attitudes and peer behaviors on adolescent sexual behavior (onset of sexual behavior and risky sexual behavior) is conditioned by the level of involvement with one's peers.

## Chapter 4: Data and Methods

### *Data*

The data for this analysis come from the National Longitudinal Study of Adolescent Health (AddHealth). The AddHealth data were originally collected to be a nationally representative sample of adolescents in grades 7-12 with detailed information on the lives and activities of teenagers in the United States. This survey began as a school based-study with the primary sampling frame taken from the Quality Education Database.<sup>13</sup> The original sample consisted of approximately 90,000 students nested within 129 randomly selected schools throughout the United States, stratified by region, urbanicity, school type (public, private, parochial), ethnicity composition, and size.<sup>14</sup> After this initial data collection effort, approximately 20,000 students were randomly selected for in-depth follow-up interviews approximately 1-7 months after the in-school survey was completed. Within each stratum of schools, around 17 students were randomly chosen to complete the in-home interview, resulting in approximately 200 adolescents interviewed from each of the 80 pairs of schools. Thus, Wave I contains the information gathered from school and home settings for these students. Approximately one year later, 14,000 students had a second in-home interview (a response rate of about 88%), during which they answered most of the same questions they had fielded the prior year.

---

<sup>13</sup> The Quality Education Database is a data source that lists all high schools and high school students in the United States.

<sup>14</sup> For a detailed description of the AddHealth survey design see the project's website as: <http://www.cpc.unc.edu/projects/addhealth/design.html>.

Contained within this longitudinal data is a “saturation sample.” AddHealth researchers selected 16 different schools and attempts were made to interview *all* of the students within in these schools at two separate points in time, a Wave 1 in-home interview and a second in-home interview nearly one year later. This resulted in a total sample of 2,728 teenagers that were interviewed. The saturation data have a unique benefit for researchers interested in peer variables. The AddHealth data created each adolescent’s peer network by asking each respondent to nominate up to five of their closest male and female friends during the in-school survey. The respondents were also informed that these nominations should be ranked in order of closeness (i.e. the first nomination should be considered one’s best friend, the second nomination the next closest friend, etc.). The respondents identified their friends on a school roster and entered the corresponding identification number on their survey form. If one’s friends were in the same school as the adolescent, then both were interviewed and answered the same questions. Since adolescents within the saturation sample had nominated friends within their school interviewed, it is possible to link adolescents to their peer’s self-reported attitudes and behaviors.

Due to the unique qualities of same-sex best friendships regarding peer influence, which is discussed below in further detail, this research uses the first nominated peer of the same-sex as source of peer information. Unfortunately, one of the limitations of the AddHealth data is that there is a boundary placed on the friendship networks. Adolescent friendships outside of school are not captured by the friendship networks of the AddHealth. Therefore, the self-report information about a best friend of a respondent is not available if an adolescent’s best friend attends another school. Fortunately, previous

studies using the AddHealth data have analyzed friendship nominations in order to measure how common out-of-school friendship nominations are. Upon analysis, Haynie (2002) found that out-of-school friendships are relatively uncommon and, therefore, they very unlikely to jeopardize the validity of findings regarding peer influence.<sup>15</sup> Her findings are in accordance with other research that finds most adolescent friendships are between adolescents in the same school (Blythe et al., 1982; Haynie, 2002:110).

### *Sample Reduction*

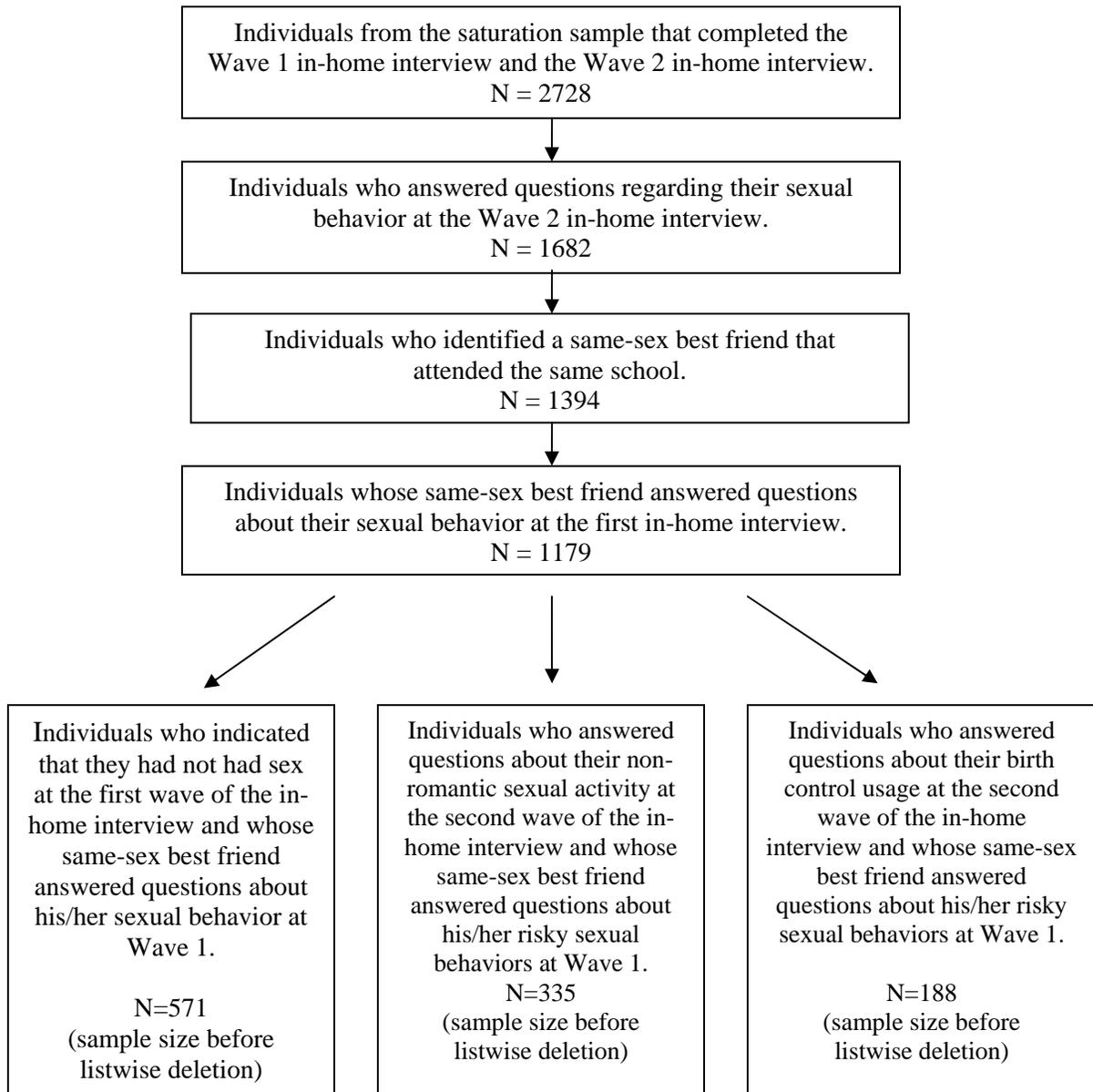
In order to achieve the final sample for this analysis, the AddHealth data underwent multiple layers of sample reduction (see Figure 1, which provides a graphical description). The AddHealth saturation sample is comprised of two waves of in-home interviews, and attempts were made to conduct a second in-home interview nearly a year after the first. Since the researchers of the AddHealth data were unable to interview all of the individuals who completed the first wave of the in-home interview for a variety of reasons (e.g. went to college, moved away or could not be located), the final size of the saturation sample after two waves of data collection is 2,728 adolescents.

A second layer of data reduction was conducted by limiting the sample to individuals who were asked and answered questions regarding their sexual behaviors (i.e., have valid data on the outcomes of interest) during the second in-home interview. There are multiple reasons for the large drop in the sample size between the first and second layer of sample reduction. First, some of this layer of data loss is a result of AddHealth interview procedures, which limited questions regarding sexual activity to

---

<sup>15</sup> Haynie (2002:110) found that on average 5.7 friends were nominated by a respondent with 1.35 not located in the same school. In addition, she found that the number of delinquent friends versus nondelinquent friends outside of school were not significantly different (1.4 vs. 1.3). Therefore, there is no reason to think that friendships outside of school are any different from friendships inside school.

**Figure 1: Description of Sample Reduction**



only those respondents who were 15 years or older when the second in-home interview was administered. Adolescents who were not 15 years old at the time of the second in-home interview had the option of skipping complete sections of the in-home interview (Contraception and Joint Occurrences) if they wished to refrain from answering questions regarding sexual activities. However, this reduction in sample size is mostly a result of respondents refusing to answer questions regarding their sexual behavior. Of the 2,728 participants who completed both the first and second waves of the in-home interview, 1,046 adolescents failed to answer questions in sections that asked about their sexual behavior. This layer of data loss resulted in 1,682 available cases for this analysis.

The next layer of data loss results from missing peer network data, specifically if an adolescent did not have a same-sex best friend who attended the same school. This criterion for analysis limited the sample to 1,394 respondents, which is 51% of the original saturation sample. In order to determine whether peer attitudes, peer behaviors, or both affect an adolescent's sexual behavior, each respondent's behavior must be merged with his or her best friend's attitudes and behaviors. Thus, not only did the subject have to identify a same-school, same-sex best friend, but this friend must have also completed the Wave I in-home interview, during which he or she answered questions about sexual attitudes and behaviors. This requirement resulted in losing an additional 215 participants, reducing the sample to 1179 subjects, which is 43% of the original saturation sample.

The last layers of sample reduction are specific to each research hypothesis addressed. In order to determine the impact of peer influence on an adolescent's first sex, the sample is limited to those adolescents who had not yet engaged in sex at the first

wave of data collection. These 571 subjects make up 21% of the original saturation sample. The other analyses focus on risky sexual behavior *and* each respondent's peers had to answer questions about their risky sexual behaviors and attitudes. This final layer of sample reduction for the risky sexual behavior analyses resulted in a final sample size of 335 adolescents for the analysis of peer influence on sexual activity outside of a romantic relationship is 335 adolescents, which is 12% of the original saturation sample, and 188 adolescents for the analysis of peer influence on birth control usage, which is 7% of the original saturation sample.

Due to the small sizes of the final samples (N=571, N=335 and N=188) relative to the size of the saturation sample (N=2728), it is very likely that the final sample for this analysis is not a valid representation of the initial sample for analysis.<sup>16</sup> Therefore, it is worthwhile to determine if and how the final samples are statistically different from the initial sexual behavior samples on an array of independent variables. This also allows the author to determine if there is the possibility of any potential bias stemming from the characteristics of the final sample.

Table 1a provides a basis for comparison of the sexual onset sample to all of the respondents who were not sexually active at the first wave of data collection. The non-sexually active teens at wave 1 are statistically different on every measure except for the level of peer involvement than those teens that experienced their sexual onset by the second wave of the in-home interviews. With regard to age, the average age of all of the non-sexually active teens is 17.24 at the second wave of data collection, and the average age of those who experienced sexual onset is 16.90. The virgin sample at the first wave

---

<sup>16</sup> The saturation sample is not, nor was it intended to be, a representative sample of adolescents in the United States.

**Table 1a: Descriptive Statistics for Sexual Onset**

Variable	Virgins at Wave 1		Sexual Onset Sample	
	N	Mean S.D.	N	Mean S.D.
Peer Sexual Attitudes	1025	x = 2.45 s.d. = .95	571	x =2.30* s.d. =.97
Peer Sexual Behavior	811	0.59*	571	0.28*
Involvement	998	x =3.36* s.d. =1.47	575	x =3.08* s.d. =1.53
Low Self-Control	1029	x =2.74* s.d. =1.10	573	x=3.08* s.d.=1.53
Puberty	1012	x =3.34* s.d. =1.13	571	x =3.15* s.d. =1.00
Mother's Attitude toward Sex	874	x =2.33* s.d. =1.22	510	x =1.68* s.d. =.98
Parental Monitoring	804	x =1.94 s.d. =.91	570	x =1.92 s.d. =.97
Relationship with Parents	1025	x =4.71* s.d. =.66	574	x =4.82* s.d. =.53
Religiosity	877	x =3.28* s.d. =.74	515	x =3.39* s.d. =.70
Age	1038	x =17.24* s.d. =1.30	575	x =16.90* s.d.=1.01
Female	1038	0.53*	575	0.48*
Black	1038	0.20*	575	0.07*

\* Statistically different (p&lt;.05)

**Table 1b: Descriptive Statistics for Risky Sexual Behavior**

Variable	Risky Sexual Behavior Sample		Sex Outside Relationship		Infrequent Birth Control Use	
	N	Mean S.D.	N	Means S.D.	N	Mean S.D.
Peer Sexual Attitude (Attractive)	428	x =2.43 s.d. =.99	337	x=2.5104* s.d.=.77	-	-
Peer Sexual Attitude (Birth Control Usage)	459	x =1.98 s.d. =1.18	-	-	188	x=2.04* s.d.=1.14
Peer Risky Sexual Behavior	368	x =1.33 s.d.=.75	337	x=1.30 s.d.=.77	188	x=1.24*‡ s.d.=.80
Involvement	1191	x =3.31 s.d. =1.47	337	x=3.36* s.d.=1.50	188	x=3.51*‡ s.d.=1.47
Low Self-Control	1214	x =2.81 s.d. =1.10	336	x=2.81 s.d.=1.04	188	x=2.74*‡ s.d.=1.03
Puberty	1203	x =3.33 s.d. =1.11	335	x=3.27* s.d.=1.12	188	x=3.37*‡ s.d.=1.12
Mother's Attitude toward Sex	1125	x =1.69 s.d. =1.00	315	x=2.11* s.d.=1.19	172	x=2.14* s.d.=1.17
Parental Monitoring	615	x =1.95 s.d. =.92	333	x=2.83* s.d.=.97	186	x=2.82*‡ s.d.=.93
Relationship with Parents	1213	x =4.71 s.d. =.66	337	x=4.76 s.d.=.57	188	x=4.73 s.d.=.60
Religiosity	1040	x =3.29 s.d. =.73	301	x=3.21* s.d.=.81	164	x=3.13*‡ s.d.=.8076
Age	1682	x =16.27 s.d. =1.57	337	x=17.33* s.d.=.98	188	x=17.38*‡ s.d.=1.00
Female	1682	0.48	337	0.58*	188	0.54*‡
Black	1682	0.12	337	0.10*	188	0.12

\* Statistically different from Risky Sexual Behavior Sample (p<.05)

‡ Statistically different from Sex Outside Relationship Sample (p<.05)

of data collection also differs from those who experienced sexual onset because it includes more females (53%) and more Black respondents (20%) compared to the sexual onset sample which is 48% female and 7% Black.

Table 1b displays the results of the attrition analysis for the risky sexual behavior samples. The comparison sample contains all of the respondents who answered the questions as to whether or not they were sexually active at the second wave of the in-home interview. Of the 1,682 respondents who answered whether or not they were sexually active, only 966 respondents answered questions about their risky sexual behavior during second wave of the in-home interview. The average age of the sex outside of a romantic relationship sample is 17.32 years old, which is statistically different ( $p < .01$ ) from the infrequent birth control usage sample (17.14 years of age) and the sexual onset sample (16.90 years old). Turning to self-control, the sex outside of a romantic relationship sample, on average, displays lower levels of self-control (2.81) than the infrequent birth control usage sample (2.74), and these averages are statistically different from each other at an alpha level of .01. Finally, those adolescents who engage in infrequent birth control usage have a best friend who, on average, engages in less risky sexual behaviors (1.24) compared to the risky non-romantic sexual activity sample (1.30).

### Measures<sup>17</sup>

#### *Dependent Variables*

*Onset of Sexual Behavior:* Each respondent in the AddHealth data was asked at each wave of the in-home interview “Have you ever had sexual intercourse? When we say sexual intercourse, we mean when a male inserts his penis into a female’s vagina.” This analysis only includes respondents who did not have sex at wave one, so that it can

---

<sup>17</sup> Table 1 and 1a provide all the descriptive statistics for each variable in the current research.

adequately capture “onset.” For these respondents, their answer to this same question at Wave II serves as the outcome measure (0 = no and 1 = yes). Of the 571 individuals who did not have sex before the first in-home interview, 24.34% had engaged in sex by the second wave of the in-home interview.

*Risky Sexual Behavior:* Sexual behaviors in adolescence that increase the chance of pregnancy or sexually transmitted disease are considered to be especially risky for adolescents due to the negative life consequences that hamper one’s future (CDC, 2006).<sup>18</sup> Previous research on risky sexual behavior during adolescence has largely relied upon the scale created by Metzler et al. (1992), which focuses on: the age of first intercourse; birth control usage; sex outside a romantic relationship; the number of sexual partners; the acquisition of an sexually transmitted disease; and, the joint occurrence of sex and alcohol and/or drugs (Bearman & Bruckner, 1999; Biglan et al., 1990; Biglan et al., 1995; Henrich et al., 2006; Majumdar, 2003; Manning et al., 2005; Metzler et al., 1992; Metzler et al., 1994; Whitaker & Miller, 2000).

The first outcome variable for risky sexual behavior deals with an adolescent’s birth control usage. When an adolescent uses birth control infrequently, he or she is more likely to contract a sexually transmitted disease or the female is more likely to become pregnant. Tapping into this form of risky sexual behavior, the AddHealth asks each respondent to think about all of the times that they had sexual intercourse and to indicate “About what proportion of the time have you or a partner of yours used birth control, that

---

<sup>18</sup> Not only can risky sexual behaviors be the source of immediate negative consequences, such as teen pregnancy and sexually transmitted diseases, but, at times, these consequences can have lifelong effects. Teen pregnancies and sexually transmitted diseases affect both sexes, causing long-term emotional distress and/or financial hardship. Much of the interest in discovering the causes of risky sexual behavior for adolescents stems from their label as social health problems leading them to be of great concern to policy makers and the Center for Disease Control (CDC, 2006; CDC, 2007)

is, some form of pregnancy protection?”. This question forms the first dependent variable for risky sexual behavior. It was originally measured with the following scale: 1= all of the time, 2 = most of the time, 3 = half of the time, 4 = some of the time, 5 = none of the time. For this research, this variable was recoded to binary form indicating whether or not the respondent uses birth control frequently or more than half of the time that he or she has sex (0 = yes, 1= no). Of the 188 individuals who answered this question, 37.76% of the respondents did not use birth control in at least half of their sexual encounters.

The second outcome of risky sexual behavior is sex outside of a romantic relationship. This taps into adolescent promiscuity or a lack of monogamy on the part of the adolescent, which exponentially increases one’s chances for acquiring a sexually transmitted disease (Metzler et al., 1994). The AddHealth directly asked each respondent about this form of risky sexual behavior: “Not counting the people you described as romantic relationships, since the month of your last interview, have you had a sexual relationship with anyone?”. This question was measured in the following way: 0 = no and 1 = yes. Two-hundred and seventy two individuals answered this question and 40.3% responded that they had engaged in sexual intercourse with a person whom they were not romantically involved.

#### *Independent Variables: Peer Attitudes and Peer Behaviors*

Gottfredson and Hirschi (1990) have argued studies that find significant peer effects suffer from measurement contamination because peer measures using perceptions are biased leading to an overestimation of the true effects of peer influence. Accounting for the arguments of Gottfredson and Hirschi (1990) and following the example set forth

by other research that has examined peer influence and risky behaviors (Billy, Rodgers & Udry, 1984; Billy Udry, 1985; Garnier & Stein, 2001; Jaccard et al., 2005; Majumdar, 2003; Urberg, 1991), this study uses the self-reports of attitudes and behaviors of each respondent's best friend in order to measure peer influence on sexual behavior.

The best friend was selected as the source of peer influence since it has been argued that the best friend is the ideal person to choose for the analysis of peer influence (Akers, 1998:79). Indeed, best friendships tend to be mutual with a strong bond and longevity. It is these qualities of friendship that make peer relationships highly influential (Cohen, 1983; Akers, 1998). In fact, Morgan and Grube (1991) found that a best friend was "uniquely influential" exerting more influence over a best friend than peers whom the respondent identified as friends (p.159).

In the first wave of the AddHealth data, each respondent was asked to nominate up to five male and five female friends. This part of the survey began with the request, "First, tell me the name of your 5 best male friends, starting with your best male friend." It asked the same question regarding female friends. For this research, the best friend is operationalized as the first nominated friend of the same sex. The use of the first nomination as the best friend aligns with the findings McGloin (2009) who explored the amount of time respondents spent with their nominated friends and found that respondents spent the most time with their first nominated same-sex friend.

*Peer Behavior for Sexual Onset Analysis:* Because the AddHealth asked each respondent whether or not they have had sexual intercourse at each wave of the in-home interview, this analysis uses the response given by the nominated best friend of the same sex (0 = no and 1 = yes) at the first wave of data collection as the measure of peer

involvement in sexual behavior. Five hundred and seventy one people identified best friends who answered the question as to whether or not they had engaged in sex and 27% of the respondents had a best friend who was sexually active.

*Peer Attitudes for Sexual Onset Analysis* The AddHealth data also asked each respondent to indicate how much they agreed or disagreed with statements regarding the benefits and consequences of sex. In order to determine a peer's favorable or unfavorable attitude toward sex in this analysis, the best friend's response to the following statement is used: "If you had sexual intercourse, it would make you more attractive" (1 = strongly disagree, 2= disagree, 3 = neither agree nor disagree, 4 = agree, 5 = agree). All 571 subjects identified best friends who answered this question. Of the best friends who answered this question, 36.1% indicated that they neither agreed nor disagreed with the statement, 53.3% indicated that they disagreed with the statement, and 10.6% indicated that they agreed in some way with the statement. This resulted in an average score of 2.51, indicating that on average the best friends in this sample tend to disagree with the statement that sex makes a person more attractive.

*Peer Behavior for Risky Sexual Behavior Analysis:* In order to determine whether or not the respondent's best friend was involved in risky sexual behavior at Time 1, this analysis relies upon three questions asked during the first wave of in-home interviews: "Not counting the people you described as romantic relationships, have you had a sexual relationship with anyone?"; "Did you or your partner use any method of birth control the first time you had sexual intercourse?"; and "In what year did you have sexual intercourse for the very first time?". The first two questions were measured dichotomously (0 = no and 1 = yes). The last question required the respondents to

provide the year when they first had sex. The birth year was then subtracted from the year of first sex in order to get the age of the respondent when they first had sex. Relying upon previous research which has listed an age of first sex at 13 or younger as risky (Henrich et al., 2006; Majumdar 2003; Metzler et al, 1992), this variable was then recoded as a 0 if the respondent's age of first sex was above 13 and as a 1 if the respondent's age of first sex was 13 or younger. These three dichotomous variables were then summed to create the continuous variable indicating the number of risky sexual behaviors in which the peer was involved. The average number of risky sexual behaviors reported by the best friend was 1.30 (sd = .77).

*Peer Attitudes for Risky Sexual Behavior Analysis:* For the risky sexual behavior outcome of sex outside a romantic relationship, the peer attitude variable for sexual onset, "If you had sexual intercourse, it would make you more attractive," is used because it not only demonstrates a favorable or unfavorable attitude toward sex but it also portrays sexual activity as a means to an end (see previous paragraph for measurement). Among this sample, the average peer score for the likert scale of agreement to the statement that sex makes one more attractive was 2.51 (sd = .99). The peer attitude variable for the risky sexual behavior infrequent birth control usage relies upon an opinion question regarding the use of birth control taken from the AddHealth questionnaire. The first in-home interview asked each participant his or her feelings toward the following statement: "In general, birth control is too much of a hassle to use". Their response was measured in the following way: 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree). For the identified best friends, 70% disagreed with the statement to some extent, while around 15% neither agreed nor disagreed, and only

12.7% agreed to some extent that birth control is too much of a hassle to use. The average score on this measure was 2.03 (sd = 1.13).

*Conditioning Variable: Peer Involvement*

In order to account for the arguments of Sutherland (1960) and Agnew (1991) who stressed the need for intensity and frequency in order for peer influence to occur, a measure is included to account for the amount of time, *Involvement*, each respondent spends with his or her best friend. In the AddHealth data, each friendship nomination was followed by a set of questions asking whether or not the respondent went to the friend's house during the past 7 days, met with the friend outside of school, spent time with the friend over the past weekend, talked to the friend about a problem and talked to the friend on the telephone during the past 7 days (for all, 0 = no and 1 = yes). An involvement measure was created from these questions by summing the five responses, with higher values indicating higher levels of involvement.<sup>19</sup> Among the individuals who answered all the questions regarding involvement with their same-sex best friend, the average score of involvement was 3.08 (sd=1.52) for the sample for sexual onset, 3.36 (sd=1.46) for the sex outside of a relationship sample and 3.51 (sd=1.47) for the sample for risky sexual behavior.

*Control Variables for Sexual Onset and Risky Sexual Behavior Analyses*

*Self-control:* When studying peer influence, it is prudent to have a baseline measure to account for a subject's propensity to engage in non-normative behaviors. Gottfredson and Hirschi (1990) referred to this propensity to engage in deviant behaviors as low-self control, and they argued that low self-control made peer effects spurious. However, research has shown that peer effects remain significant even when accounting

---

<sup>19</sup> The reliability of this measure is .37.

for the propensity to engage in non-normative behaviors (McGloin & Shermer, 2009; Pratt & Cullen, 2000). Even so, the bulk of these studies had delinquency as outcomes, not sexual behavior. In the spirit of not generalizing too loosely, and preventing the overestimation of peer effects, this analysis accounts for low self-control.

A measure of impulsivity, one of the key elements of low self-control, as outlined by Gottfredson and Hirschi (1990) and Grasmick et al. (1993) is used as a measure of low self-control. This measure also taps into Hirschi's (2004) redefinition of self-control as the tendency to ignore the full range of consequences of one's acts (Paternoster & Pogarsky, 2009). The measure of self-control for this study used the respondent's level of agreement to the following statement "when making decisions, you usually go with your gut feeling without thinking too much about the consequences of each alternative." The respondents answers were in the following form: 1=strongly disagree, 2= disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree. Higher values indicate lower levels of self-control. With regard to the sexual onset sample, the average score on this likert scale was 3.08 (sd=1.12), while the average score for the sexual activity outside of a romantic relationship was 2.81 (sd=1.04) and the score for the birth control usage sample was 2.74 (sd=1.03)

*Puberty:* According to Brooks-Gunn and Furstenburg (1989), one must account for biological controls when studying the sexual behavior of adolescents. Regarding the role of biology in adolescent sexual behavior, current research must take note of the fact that puberty acts as a stimulus for sexual behavior (Brooks-Gunn & Furstenburg, 1989; Johnson & Tyler, 2007). Previous research that has included this type of measure has focused on the stage of puberty in comparison to one's age mates and found that

adolescents who matured earlier or felt that they looked older engaged in more maladaptive behaviors than adolescents whose development was similar to that of their peers (Felson & Haynie, 2002; Peterson & Taylor, 1980; Williams & Dunlop, 1999). Following this logic, this analysis follows a similar method and rely upon each respondent's answer to the question: "How advanced is your physical development compared to other boys/girls your age?". The answers to this question were in the following form: 1 = I look younger than most, 2 = I look younger than some, 3 = I look about average, 4 = I look older than some, 5 = I look older than most. Among the individuals from each sample who answered this question relative to their respective gender mates, the average score was 3.16 (sd=1.00) for the sexual onset sample, 3.27 (1.10) for the sexual activity outside of a relationship sample and 3.37 (sd=1.12) for the infrequent birth control usage sample, indicating that on average, these individuals felt that their physical development was similar to their same-sex peers.

*Parental Controls:* Research on adolescent sexual behavior has also repeatedly demonstrated that parental variables, although not the most robust predictor of adolescent sexual activity, are still influential in an adolescent's sexual behavior (Armour & Haynie, 2006; Bearman and Bruckner, 2001; Biglan et al., 1990; Henrich et al., 2006; Luster & Small, 1994; Majumdar, 2003; Metzler et al., 1994; Moore & Rosenthal, 1991; Rosenthal, Moore & Flynn, 1991). Consequently, variables depicting the respondent's relationship with his or her parents are included in the model in order to prevent an overestimation of peer effects on sexual behavior. Prior research has shown that parental monitoring has an effect on adolescent sexual behavior (Armour & Haynie, 2006; Bearman and Bruckner, 2001; Biglan et al., 1990; Henrich et al., 2006; Lohman &

Billings, 2008; Luster & Small, 1994; Majumdar, 2003; Metzler et al., 1994; Moore & Rosenthal, 1991; Rosenthal, Moore & Flynn, 1991). Therefore, a measure is included in the model in order to account for the restrictiveness of one's parents. This variable is based on 4 questions from the AddHealth data asked of the respondent in the first wave of the in-home interview. Each respondent was asked whether or not his or her parents let him or her make one's own decisions regarding the "time you must be home on weekend nights", "the people you hang around with", and "what time you go to bed on week night". All of the responses to these questions were 0 = no and 1 = yes. The score of each of the responses to these variables were added together to create a summative scale with higher scores indicating lower levels of parental monitoring.<sup>20</sup> The average score of parental monitoring for the sexual onset sample is 2.78 (sd=.97) and the average score of parental monitoring for the risky sexual behavior sample of sex outside a relationship was 2.83 (sd=.96) and 2.82 (sd=.93) for the birth control usage sample.

Research on adolescent sexual behavior has also shown that parental attitudes toward sex are indicative of a teenager's sexual behavior (Majumdar, 2003; Small & Luster, 1994). Therefore, the attitude of one's mother towards sex is included as control variables in this analysis.<sup>21</sup> The AddHealth data asked each respondent about how their mother would feel "about your having sex at this time in your life." The responses to this question were in the following form of agreement with involvement in sexual behavior:

1= strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly

---

<sup>20</sup> Parental say on friendship selection of adolescents was also run as a separate measure, but, on its own, it was not a significant predictor of peer influence on sexual activity.

<sup>21</sup> It is worth noting that, on average, fathers were more disagreeable towards the sexual activities of their children compared to mothers (1.64 vs. 1.96, respectively); however, the attitudes of one's father toward sex is not included in this analysis since many of these adolescents refrained from answering this question. This is a result of adolescents not living with their father, not knowing their father well or at all, or they did not know what their father's attitude toward sex was. If this variable were to be included in these analyses, listwise deletion would severely limit each sample by almost half.

agree). The mean score of a mother's attitude toward sex for individuals in the sexual onset sample is 1.68 (sd=.98) while the mean score of a mother's attitude toward sex for individuals in the risky sexual behavior sample is 2.11 (sd=1.18) for the sex outside of a relationship sample and 2.14 (sd=1.17) for the birth control usage sample.

Literature also suggests that adolescents tend to identify more with their peers on sexual topics than with their parents when an adolescent's relationship with his or her parents is strained (Jaccard et al., 2005). Moreover, when parental communication increases, one's involvement in risky sexual behavior tends to decrease (Majumdar, 2003). As a result, a variable indicating the relationship with one's parents is included in this analysis in order to account for how close an adolescent feels to his or her parents. AddHealth asked each respondent "How much do you feel that your parents care about you?" The possible responses to this question were 1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a bit, and 5 = very much. On average, this sample of adolescents felt cared for by their parents with the average scores on this scale ranging from 4.82 (sd=.53) in the sexual onset sample to 4.7 (sd=.6) for the risky sexual behavior samples.

*Religiosity:* Prior research regarding the significance of adolescent religiosity on sexual behavior has shown that religion plays a role in adolescent's decision to have sex (Armour & Haynie, 2007; Lammers et al., 2000; Manning et al., 2005). In fact, as the importance of religion increases, the more likely he or she is to refrain from sexual behavior. Therefore, the importance of religion to an adolescent, otherwise known as religiosity, is included in this analysis as a control variable. Among the 515 adolescents in the sexual onset sample who answered the question "How important is religion to you?", the average score was 3.39 (sd=.70) on the following response scale: 1= not

important at all, 2 = fairly unimportant, 3 = fairly important, and 4 = very important. Only 301 adolescents in the sexual activity outside a romantic relationship sample and 164 adolescents in the birth control usage sample answered this survey question, and their average scores were 3.21 (sd=.78) and 3.13 (sd=.81), respectively.

*Demographic Controls:* Research on peer influence always includes demographic control variables in order to isolate the effects of peer influence on adolescent behavior. A dummy variable for gender is included in this analysis in order to account for 48% of the sexual onset sample being male, 58% of the sex outside a relationship sample being male and 54% of the birth control sample male. In addition, the age of the respondent is included as a control since the odds of sexual activity increase with age (Majumdar, 2003; Nahom et al., 2001) and it is a traditional control variable when accounting for peer influence on non-normative behaviors (Armour & Haynie, 2006; Bearman & Bruckner, 2001; Henrich et al, 2006; Luster & Small, 1994; Warr, 1993). In this analysis, the range of ages for the adolescents was from 14 to 19 years old and the average age of the individuals in the sexual onset sample is 16.9 (sd=1.01) and the average age of the risky sexual behavior samples was 17.32 (sd=.98) for the sex outside of a relationship sample and 17.38 (sd=1.0) for the birth control sample.

Research has also noted a relationship between an adolescent's race and his or her sexual behavior. For instance, it has been demonstrated that Black adolescents tend to have a younger age of first sex and are more likely to have peer norms that approve of multiple sexual behaviors (Regan et al., 2004). However, Billy and Udry (1985) found that Black adolescents conform to the attitudes and behaviors of peers much less than other races. Furthermore, Henrich et al. (2006) found that Black adolescents, in general,

had a lower risk for sexual risk behavior. Even though prior research regarding the impact of peers on risky sexual behaviors for blacks is mixed, it still indicates that there is a fundamental difference between Blacks and whites regarding peer influence and sexual activity. Therefore, a dummy variable for race (Black = 1, other race = 0) is included in the model. As noted earlier, 7% of the sexual onset sample that is Black compared to 10 and 12% in the risky sexual behavior samples.<sup>22</sup>

### Analytic Plan

The AddHealth data consist of individuals clustered within schools; failing to account for this clustering can produce biased standard errors because of a violation of the assumption of independence among the units of analysis. In order to account for clustering, researchers have typically relied on random effect or fixed effect models (Greene, 2003). A random effects model assumes that the unobserved heterogeneity within the sample is random. Because the 16 schools selected to be part of the saturation sample are not randomly drawn from the population of schools in the US, however, it may not be appropriate to use this model (McGloin, 2009). In contrast, a fixed effects model does not assume that the schools within the AddHealth saturation sample were selected randomly. In essence, using fixed effects includes a constant for each school, thereby providing more precise slope estimates.

Because the outcomes for sexual onset, sex outside a romantic relationship, and infrequent birth control usage are binary, the analyses regarding peer influence on these

---

<sup>22</sup> Two other demographic variables were initially included in the analysis, receipt of public assistance (0=no, 1=yes) and living in a two-parent household (0 = single parent household and 1 = two parent household). When the initial analyses were run, it was noted that these two variables alone accounted for significant drops in the sample size due to listwise deletion. Since neither of the dummy variables was significant in any model within any sample, likely due to the lack of variation in response, both variables were dropped from the final analysis.

forms of sexual behavior relies upon logistic regression with fixed effects (see Chamberlain 1982). In order to address each of the hypotheses presented, the analysis proceeds in stages. First, regression models determine the effects of peer attitudes and peer behaviors on the onset of sexual behavior and on both outcomes of risky sexual behavior. The next step of the analysis is to determine whether or not the combination of peer attitudes and peer behaviors is influential on sexual behavior during adolescence. This is done by adding an interaction variable between the respective peer attitude and behavior measures for each model. Finally, the analysis addresses the third hypothesis by determining the extent to which peer influence is conditioned by peer involvement. This is accomplished by including interaction variables between (1) peer involvement and the relevant peer attitude measure and (2) peer involvement and the relevant peer behavior.<sup>23</sup>

---

<sup>23</sup> All variable components that make up part of an interaction term are mean-centered.

## Chapter 5: Results

Before reporting the results of the logistic regression analyses examining the effects of peer influence on adolescent sexual behavior, a discussion of the correlations between the main variables of interest is warranted. Table 2 presents the correlation matrix containing each of the variables used in the subsequent analyses. From Table 2 it is clear that the dependent variable “sexual onset” has a statistically significant ( $p < .05$ ) and positive relationship with peer involvement in sexual activity. Contrary to expectations, peer attitudes toward sex have a negative and non-significant relationship with adolescent sexual onset. The respective correlations are .34 for peer involvement in sexual activity and  $-.05$  for peer attitudes toward sexual activity.

Table 2 also presents the correlation between the second dependent variable, sexual activity outside a romantic relationship, and the independent variables. While both peer attitudes and peer involvement in risky sexual behavior have a positive relationship with non romantic sexual activity, the relationship is negligible at .01 for both independent variables. However, it is worth noting that peer involvement in any form of sexual activity has a positive and statistically significant relationship ( $r = .17$ ) with sex with a non-romantic partner which is worth further exploration in subsequent analyses.

Turning to the final outcome of interest, peer attitudes toward birth control usage have a negative relationship with the dependent variable ( $r = -.07$ ) and peer involvement in risky sexual behavior has no relationship with the outcome of interest. The negative

Table 2: Correlation Matrix<sup>24</sup>

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1.	1.00																
2.	.34*	1.00															
3.	.04	.04	1.00														
4.	.20*	.17*	-.03	1.00													
5.	-.05	.01	.00	.14*	1.00												
6.	-.06	.01	-.07	-	-.01	1.00											
7.	-.05	.01	.00	.14*	.14*	-.01	1.00										
8.	.04	.08*	-.03	.14*	.12*	.17*	.12*	1.00									
9.	.04	.05*	-.04	.03	.03	.07	.03	-.03	1.00								
10.	.19*	.14*	.05	.31*	.05	-.10	.05	.07*	-.06*	1.00							
11.	-.11	-.03	-.06	-.08	-.18	-.15	-.08	-.11	.12	.09	1.00						
12.	.04	.04*	-.06	.03	-.04	.05	-.04	.00	.00	-.08*	-.16	1.00					
13.	.02	.04*	-.03	.08*	-.07*	.03	.07*	.02	.00	.22*	.00	.06*	1.00				
14.	.15*	-.04*	.00	-.06*	.00	-.03	.00	-.03	.00	-.10*	.05	.02	-.01	1.00			
15.	-.09*	.14*	.00	.20*	.10*	.17*	.10*	.25*	.13*	.16*	.04	.02	.10*	-.06*	1.00		
16.	-.13*	-.07*	-.03	-.13*	.06	-.03	.06	-.06*	.14*	-.07*	.07	-.02	-.08*	.14*	.09*	1.00	
17.	.05	-.16	.01	-.01	-.15	.02	.10	-.18	-.13	-.18	.00	.05	.09	.07	.08	-.10	1.00

p < .05 (two-tailed test)

1. Sexual Onset at second wave of data collection
2. Sex outside of a romantic relationship at second wave of data collection
3. Infrequent birth control usage at second wave of data collection
4. Best friend's involvement in sex
5. Best friend's attitude toward sex
6. Best friend's risky sexual behavior
7. Best friend's attitude about birth control usage
8. Female
9. Black
10. Age
11. Self-control
12. Puberty
13. Parental monitoring
14. Mom's opinion about sex
15. Relationship with parents
16. Religiosity
17. Involvement with best friend

<sup>24</sup> The correlation between a best friend's involvement in sex at wave 1 and his or her involvement in risky sexual behavior at wave 1 is not reported. This correlation is one since only those peers who were sexually active at wave 1 answered questions at their risky sexual behavior.

relationship between peer attitudes toward birth control usage and infrequent birth control usage is contrary to existing literature, which has found that peers who have positive attitudes toward infrequent birth control usage generally predict infrequent birth control usage. Moreover, the lack of a statistical association between peer involvement in risky sexual behavior and adolescent involvement in risky sexual behavior also contradicts previous literature which has found that peer involvement in risky sexual behavior predicts adolescent risky sexual behavior.

Table 3 presents the results regarding peer influence on adolescent sexual onset. Model 1 illustrates that peer involvement in sexual activity increases the likelihood of sexual onset ( $p < .01$ ). In fact, the odds ratio demonstrates that an adolescent who has a friend who is sexually active is 2.36 times more likely to engage in sexual intercourse than an adolescent whose best friend is not sexually active, controlling for all other variables. Model 1 also shows that while peer attitudes toward sex have a positive relationship with sexual onset, it fails to reach significance as a predictor of sexual onset. This is contrary to previous literature which argues both peer attitudes and peer behaviors, independently, have an effect on adolescent sexual behavior (Moore & Rosenthal, 1991), but it supports the line of thinking suggesting that mechanisms of peer influence, peer attitudes and peer behaviors, are not interchangeable as mechanisms of peer influence because they operate differentially among adolescents.

Model 2 indicates that the combination of peer attitudes and peer behaviors do not increase peer influence, which is contrary to the findings of Warr and Stafford (1991). Although positive, this variable does not reach significance fails to support the

Table 3: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.857** (.246)	2.355	.463 (.642)	1.590	.631 (.561)	1.880	.855** (.248)	2.352
<b>Peer Attitude (Sex = Attractive)</b>	.123 (.132)	1.131	.050 (.173)	1.051	.125 (.132)	1.134	.449 (.268)	1.566
<b>Peer Behavior*Peer Attitude</b>	-	-	.163 (.245)	1.177	-	-	-	-
<b>Age</b>	.239 (.132)	1.270	.240 (.132)	1.271	.238 (.132)	1.269	.248 (.132)	1.282
<b>Female</b>	-.604* (.273)	.547	-.610* (.275)	.543	-.602* (.273)	.548	-.619* (.276)	.538
<b>Black</b>	.625 (.466)	1.867	.647 (.467)	1.910	.617 (.466)	1.854	.628 (.468)	1.874
<b>Self-Control</b>	-.178 (.108)	.837	-.180 (.108)	.836	-.180 (.108)	.836	-.171 (.109)	.843
<b>Pubertal Status</b>	.044 (.118)	1.045	.041 (.118)	1.042	.046 (.118)	1.047	.029 (.119)	1.030
<b>Parental Monitoring</b>	-.247* (.122)	.781	-.253* (.122)	.777	-.251* (.122)	.778	-.245* (.122)	.783
<b>Mom's Attitude</b>	.086 (.129)	1.090	.089 (.129)	1.093	.077 (.130)	1.080	.096 (.130)	1.101
<b>Relationship with Parents</b>	-.121 (.198)	.886	-.124 (.199)	.883	-.131 (.199)	.877	-.088 (.202)	.916
<b>Religiosity</b>	- .509** (.178)	.601	- .509** (.178)	.601	- .506** (.177)	.603	- .510** (.177)	.600
<b>Involvement</b>	.080 (.080)	1.083	.079 (.080)	1.082	.052 (.101)	1.053	.337 (.202)	1.401
<b>Peer Behavior*Involvement</b>	-	-	-	-	.073 (.163)	1.076	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.109 (.078)	.897

N = 436

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

second hypothesis. In fact, when an interaction term for peer behavior and peer attitudes is included in the model, the significant effect of peer behavior on sexual onset no longer reaches significance and the magnitude of the beta coefficient is cut in half (.857 vs. .463). The results for peer effects on sexual onset presented in Table 3 also fail to support the third hypothesis that peer involvement conditions the effect of peer behaviors and peer attitudes on an adolescent's decision to engage in sex. Additionally, peer involvement on its own fails to be a significant predictor of adolescent behavior challenging the previous claims of Sutherland and Akers as well as the findings of Agnew (1991) and Warr (1993).

Taking all of the significant findings into account, the standardized coefficient for peer behavior is larger than any other coefficient in the model. This complements existing research on adolescent sexual behavior which says that peers are the most important factor affecting one's decision to engage in sexual activity (Bearman & Bruckner, 1999; Jaccard et al., 2005; Kinsman et al., 1998; Moore & Rosenthal, 1993; Woodruff, 1986). Table 3 also presents noteworthy findings regarding the control variables. For instance, in all models, being female decreases the log odds of an adolescent engaging in sexual activity. Moreover, increased parental monitoring and increased importance of religion to an adolescent significantly decrease the likelihood that an adolescent experiences sexual onset (-.247 and -.509, respectively). At this point, it is also worth noting that one's level of self-control does not have a significant effect on sexual onset, even though Gottfredson and Hirschi (1990) argue for the generality of the application of low self-control to the explanation of all "deviant" behaviors.

Table 4 presents the results of the logistic regression analyses examining the second dependent variable, sex outside of a relationship. According to Table 4, it appears as though peers do not influence adolescent non-romantic sexual activity in this sample, which is contrary to existing research on peer influence and risky sexual behavior. Unlike peer influence on sexual onset, peer involvement in risky sexual behavior (operationalized as the number of risky sexual behavior in which one's peer engages) does not predict adolescent involvement in sex with a non-romantic partner. Once again, peer attitudes fail to predict adolescent sexual behavior, but this relationship is now negative instead of positive. Moreover, no other variables predicted by the second and third hypotheses have a significant effect ( $p < .05$ ) on this form of adolescent risk behavior. The only variable that significantly predicts an adolescent's involvement in sex outside a romantic relationship is Black. In fact, being Black is related to over a 250% increase in the odds of engaging in sex with a non-romantic partner, holding all else constant (odds ratios range from 2.63-3.00).

Table 5 presents the results of the regression analyses regarding peer influence on infrequent birth control usage. Similar to the results of peer influence on non-romantic sexual activity, Models 1-4 in Table 5 indicate that peers do not seem to exert a significant influence over an adolescent's infrequent birth control usage in this sample. At this point, the null findings regarding all peer variables in the analyses of peer influence on risky sexual behaviors seem to indicate that within this sample peers do not exert influence over adolescent risky sexual behavior. This finding contradicts previous research on risky sexual behavior which has shown that peers exert a modest yet

Table 4: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside a Romantic Relationship

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR
<b>Peer Behavior</b>	.054 (.194)	1.055	-.500 (.572)	.608	.289 (.558)	1.334	.040 (.194)	1.041
<b>Peer Attitude (Sex = Attractive)</b>	-.024 (.156)	.976	-.350 (.356)	.705	-.052 (.111)	.949	-.427 (.393)	.653
<b>Peer Behavior*Peer Attitude</b>	-	-	.223 (.218)	1.250	-	-	-	-
<b>Age</b>	.201 (.153)	1.223	.211 (.154)	1.234	.240 (.156)	1.271	.186 (.154)	1.204
<b>Female</b>	.057 (.326)	1.059	.055 (.328)	1.057	.032 (.312)	1.032	.043 (.325)	1.044
<b>Black</b>	.969* (.486)	2.636	1.016* (.490)	2.762	1.10* (.495)	3.003	.992* (.489)	2.698
<b>Self-Control</b>	-.175 (.137)	.839	-.182 (.138)	.834	-.203 (.141)	.816	-.181 (.138)	.834
<b>Pubertal Status</b>	-.087 (.130)	.917	-.079 (.131)	.924	-.131 (.133)	.877	-.087 (.131)	.917
<b>Parental Monitoring</b>	-.125 (.150)	.883	-.133 (.151)	.875	-.131 (.152)	.877	-.129 (.151)	.879
<b>Mom's Attitude</b>	-.001 (.128)	.999	.010 (.128)	1.01	-.012 (.129)	.988	-.010 (.129)	.990
<b>Relationship with Parents</b>	.340 (.303)	1.405	.347 (.303)	1.415	.385 (.309)	1.470	.342 (.304)	1.408
<b>Religiosity</b>	-.006 (.195)	.994	-.018 (.196)	.982	.014 (.196)	1.015	-.024 (.196)	.976
<b>Involvement</b>	.179 (.104)	1.196	.171 (.105)	1.186	.238 (.215)	1.269	-.103 (.264)	.902
<b>Peer Behavior*Involvement</b>	-	-	-	-	-.050 (.143)	.951	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	.114 (.101)	1.121

N = 277

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

significant effect on adolescent sexual risk behavior (Jaccard et al., 2005; Majumdar, 2003). However, it is possible that this is an artifact of the sample limitations.

While it may be argued that birth control usage is more “spur of the moment,” the measure of self-control based on impulsivity also fails to predict infrequent birth control usage. Similar to the findings regarding the other examined risky sexual behavior, Black is a significant and consistent predictor variable of infrequent birth control usage ( $p < .01$ ). A decrease in one’s comparative pubertal status also increases the log odds that birth control usage is infrequent ( $b = -.39$ ) is also a significant predictor of this form of risky sexual behavior. Adolescents who feel that they look younger than their age mates are more likely to use birth control infrequently compared to adolescents who feel that they look older than their age mates. This finding may be due to an adolescent feeling that he or she is too young (i.e. not physically mature enough) to incur the consequences of risky sexual behavior such as pregnancy; therefore, they feel birth control is unnecessary.<sup>25</sup>

#### Extending the Sample

One of the inherent limitations plaguing this study is the small sample size. In an attempt to increase statistical power, some of the restrictions of the initial layers of data reduction were relaxed in order to increase each sample size. These additions to the initial samples focus on those adolescents who did not nominate a same-sex best friend within their school. Specifically, the sample sizes were increased by including subjects from the saturation sample who did not list a same-sex best friend within their school but did nominate a second best friend of the same-sex within their

---

<sup>25</sup> All models were rerun with robust standard errors in order to account for potential interdependency due to peer dyads (reciprocal nominations). None of the results were significantly different from the results presented in this project.

Table 5: Fixed Effects Regression Models for Results of Peer Influence on Birth Control Usage

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR
<b>Peer Behavior</b>	.067 (.249)	1.070	-.032 (.504)	.968	.203 (.684)	1.22 5	.067 (.249)	1.07 0
<b>Peer Attitude (Birth Control Attitude)</b>	-.083 (.178)	.920	-.147 (.337)	.863	-.084 (.178)	.919	.036 (.443)	1.03 6
<b>Peer Behavior*Peer Attitude</b>	-	-	.048 (.210)	1.04 9	-	-	-	-
<b>Age</b>	-.053 (.227)	.948	-.051 (.227)	.950	-.050 (.227)	.952	-.052 (.227)	.950
<b>Female</b>	-.383 (.425)	.682	-.379 (.426)	.684	-.388 (.426)	.679	-.387 (.426)	.679
<b>Black</b>	-2.401** (.848)	.091	-2.431** (.860)	.087	-2.385** (.851)	.092	-2.365 (.859)	.094
<b>Self-Control</b>	-.171 (.192)	.843	-.173 (.192)	.841	-.177 (.195)	.838	-.170 (.192)	.844
<b>Pubertal Status</b>	-.390* (.176)	.677	-.392* (.176)	.676	-.389* (.176)	.678	-.388* (.176)	.679
<b>Parental Monitoring</b>	.326 (.203)	1.386	.318 (.205)	1.37 5	.318 (.206)	1.37 4	.332 (.204)	1.39 3
<b>Mom's Attitude</b>	.198 (.191)	1.219	.208 (.196)	1.23 2	.203 (.192)	1.22 5	.191 (.192)	1.21 0
<b>Relationship with Parents</b>	-.166 (.355)	.847	-.175 (.338)	.840	-.173 (.338)	.841	-.172 (.335)	.842
<b>Religiosity</b>	-.367 (.243)	.693	-.377 (.248)	.686	-.366 (.243)	.693	-.367 (.243)	.693
<b>Involvement</b>	-.082 (.136)	.921	-.083 (.137)	.921	-.038 (.251)	.963	-.008 (.290)	.992
<b>Peer Behavior*Involvement</b>	-	-	-	-	-.039 (.181)	.962	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.032 (.109)	.969

N = 148

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

school. By relaxing this restriction and allowing for a first or second best friend of the same-sex, the final sample size for the sexual onset sample after listwise deletion increased by 177 subjects, from 430 respondents to 607 respondents. The sample sizes for each risky sexual behavior outcome also increased. The sex outside a romantic relationship sample increased from 277 adolescents to 437 adolescents and the birth control sample increased from 148 adolescents to 222 adolescents.

Before statistical analyses were run on these new samples, a control variable was added to each model in order to account for a friend being the second nominated friend of the same sex. In each subsequent analysis, this dummy variable never reached significance, indicating that the influence of the second nominated best friend was not significantly different from the first nominated best friend. This is in line with research that has demonstrated behaviors of friends outside of school (the primary reason why first nominated best friend of the same sex is not available for measuring peer influence) are extremely similar to the behaviors of peers inside of school (Haynie, 2002).

Table 6 presents the results for the analyses of peer influence on sexual onset conducted on the sample containing both the first and second nominated friends of the same sex. Once again, the models in Table 6 show that peer involvement in sexual activity at wave 1 is a significant predictor of respondent involvement in sexual behavior at wave 2. The effect of the peer behavior as a mechanism of peer influence is also significant ( $p < .01$ ) and consistent across all models in these analyses. The coefficients and statistical significance of the other variables of interest, peer attitudes, the interaction term of peer attitudes and peer behavior, and the interaction terms of peer involvement with peer attitudes and peer behavior, mirror the findings in Table 3 and are not

Table 6: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset-1<sup>st</sup> and 2<sup>nd</sup> Best Friend of the Same Sex

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.554** (.209)	1.740	.555** (.209)	1.741	.557** (.209)	1.745	.565** (.211)	1.759
<b>Peer Attitude (Sex = Attractive)</b>	.083 (.105)	1.087	.086 (.106)	1.090	.852 (.105)	1.089	.074 (.107)	1.077
<b>Peer Behavior*Peer Attitude</b>	-	-	-.069 (.187)	.933	-	-	-	-
<b>Age</b>	.257* (.109)	1.293	.256* (.109)	1.292	.256* (.109)	1.292	.279* (.110)	1.322
<b>Female</b>	-.277 (.217)	.758	-.274 (.218)	.760	-.279 (.218)	.756	-.312 (.220)	.732
<b>Black</b>	.173 (.390)	1.189	.167 (.390)	1.182	.166 (.390)	1.180	.186 (.394)	1.204
<b>2<sup>nd</sup> Friend</b>	-.280 (.263)	.756	-.291 (.265)	.748	-.286 (.264)	.751	-.218 (.264)	.804
<b>Self-Control</b>	-.130 (.091)	.878	-.129 (.091)	.879	-.130 (.091)	.878	-.121 (.092)	.866
<b>Pubertal Status</b>	.131 (.102)	1.141	.134 (.102)	1.144	.132 (.102)	1.141	.113 (.103)	1.119
<b>Parental Monitoring</b>	-.205* (.102)	.814	-.205* (.103)	.815	-.207* (.103)	.813	-.199* (.103)	.820
<b>Mom's Attitude</b>	.084 (.106)	1.088	.084 (.106)	1.088	.078 (.107)	1.081	.098 (.108)	1.103
<b>Relationship with Parents</b>	-.229 (.164)	.795	-.230 (.164)	.794	-.237 (.165)	.789	-.190 (.167)	.827
<b>Religiosity</b>	-.368* (.150)	.692	-.368* (.150)	.692	-.365 (.150)	.694	-.381 (.151)	.683
<b>Involvement</b>	.038 (.069)	1.038	.038 (.069)	1.039	.038 (.069)	1.038	.029 (.070)	1.029
<b>Peer Behavior*Involvement</b>	-	-	-	-	.068 (.142)	1.070	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.151 (.061)	.860

N = 607

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

statistically significant predictors of sexual onset. Looking at the control variables, there are two differences between the regression analyses run on the initial sample and the analyses run on the expanded sample. First, gender is no longer a significant predictor of sexual onset, but the direction of the coefficient remained the same. Second, age is now a significant predictor of sexual onset. In fact, for each additional year of age, and adolescent is 29% more likely to experience his or her first sex.

Turning to the analyses of the expanded samples for risky sexual behaviors, Tables 7 and 8 demonstrate that the mechanisms of peer influence remain insignificant within this sample. However, the directional relationship of peer attitudes and risky sexual behavior is worth noting in Table 7. In the original sample for sexual activity outside of a romantic relationship, the a peer's positive attitude toward sex decreased the probability that an adolescent would engage in non-romantic sex, but Table 7 demonstrates that a peer's positive attitude toward sex increases the likelihood that an adolescent will engage in the sex outside of a romantic relationship. While it is possible that these contradictory findings are a result of measurement error, the fact that neither effect is significantly different from zero prevent further exploration of these seemingly opposite findings in the analysis of the effects of peer attitudes on risky sexual behavior.

Upon examination of the control variables in the analyses of peer influence on the risky sexual behavior, a few interesting findings emerge. Table 7 reveals that

Table 7: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside of a Relationship – 1<sup>st</sup> and 2<sup>nd</sup> Best Friend of the Same Sex

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.554** (.209)	1.740	.555** (.209)	1.741	.557** (.209)	1.745	.565** (.211)	1.759
<b>Peer Attitude (Sex = Attractive)</b>	.083 (.105)	1.087	.086 (.106)	1.090	.852 (.105)	1.089	.074 (.107)	1.077
<b>Peer Behavior*Peer Attitude</b>	-	-	-.069 (.187)	.933	-	-	-	-
<b>Age</b>	.257* (.109)	1.293	.256* (.109)	1.292	.256* (.109)	1.292	.279* (.110)	1.322
<b>Female</b>	-.277 (.217)	.758	-.274 (.218)	.760	-.279 (.218)	.756	-.312 (.220)	.732
<b>Black</b>	.173 (.390)	1.189	.167 (.390)	1.182	.166 (.390)	1.180	.186 (.394)	1.204
<b>2<sup>nd</sup> Friend</b>	-.280 (.263)	.756	-.291 (.265)	.748	-.286 (.264)	.751	-.218 (.264)	.804
<b>Self-Control</b>	-.130 (.091)	.878	-.129 (.091)	.879	-.130 (.091)	.878	-.121 (.092)	.866
<b>Pubertal Status</b>	.131 (.102)	1.141	.134 (.102)	1.144	.132 (.102)	1.141	.113 (.103)	1.119
<b>Parental Monitoring</b>	-.205* (.102)	.814	-.205* (.103)	.815	-.207* (.103)	.813	-.199* (.103)	.820
<b>Mom's Attitude</b>	.084 (.106)	1.088	.084 (.106)	1.088	.078 (.107)	1.081	.098 (.108)	1.103
<b>Relationship with Parents</b>	-.229 (.164)	.795	-.230 (.164)	.794	-.237 (.165)	.789	-.190 (.167)	.827
<b>Religiosity</b>	-.368* (.150)	.692	-.368* (.150)	.692	-.365 (.150)	.694	-.381 (.151)	.683
<b>Involvement</b>	.038 (.069)	1.038	.038 (.069)	1.039	.038 (.069)	1.038	.029 (.070)	1.029
<b>Peer Behavior*Involvement</b>	-	-	-	-	.068 (.142)	1.070	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.151 (.061)	.860

N = 607

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

Table 8: Fixed Effects Regression Models for Results of Peer Influence on Birth Control Usage – 1<sup>st</sup> and 2<sup>nd</sup> Best Friend of the Same Sex

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.141 (.200)	1.151	.142 (.207)	1.153	.070 (.206)	1.072	.148 (.135)	1.152
<b>Peer Attitude (Birth Control Attitude)</b>	.155 (.124)	1.168	.155 (.125)	1.168	.166 (.126)	1.180	.142 (.200)	1.160
<b>Peer Behavior*Peer Attitude</b>	-	-	-.004 (.144)	.996	-	-	-	-
<b>Age</b>	.009 (.169)	1.009	.009 (.170)	1.009	-.014 (.172)	.986	.007 (.170)	1.007
<b>Female</b>	-.349 (.324)	.705	-.350 (.327)	.704	-.332 (.327)	.717	-.350 (.326)	.704
<b>Black</b>	-2.304** (.615)	.010	-2.303** (.618)	.010	-2.445** (.630)	.087	-2.312** (.617)	.010
<b>2<sup>nd</sup> Friend</b>	.114 (.349)	1.121	.114 (.350)	1.120	.160 (.353)	1.174	.113 (.350)	1.119
<b>Self-Control</b>	.013 (.142)	1.013	.013 (.142)	1.013	.033 (.143)	1.034	.013 (.142)	1.014
<b>Pubertal Status</b>	-.222 (.141)	.801	-.222 (.141)	.801	-.237 (.141)	.789	-.223 (.141)	.800
<b>Parental Monitoring</b>	.278 (.158)	1.320	.278 (.159)	1.321	.322 (.162)	1.380	.277 (.158)	1.319
<b>Mom's Attitude</b>	.003 (.146)	1.002	.003 (.146)	1.003	-.015 (.147)	.985	.004 (.147)	1.004
<b>Relationship with Parents</b>	-.132 (.271)	.876	-.132 (.271)	.876	-.098 (.270)	.907	-.131 (.271)	.878
<b>Religiosity</b>	-.228 (.203)	.796	-.228 (.204)	.796	-.225 (.205)	.799	-.228 (.203)	.796
<b>Involvement</b>	-.018 (.106)	.982	-.018 (.106)	.982	.010 (.108)	1.010	-.022 (.111)	.978
<b>Peer Behavior*Involvement</b>	-	-	-	-	.213 (.135)	1.237	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	.011 (.083)	1.011

N = 222

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

an increase in parental monitoring decreases the likelihood that an adolescent will engage in sex outside of a relationship ( $p < .05$ ) in this expanded sample ( $b = -.21$ ). Another finding worthy of attention is the failure of pubertal status to reach significance as a predictor of birth control usage in this extended sample given that it was a significant predictor of birth control usage in the original sample. These changes in significance of the control variables draw attention to the fact that the samples are not adequate representations of the sample population and the true effects of each variable in predicting adolescent sexual behavior, yet the analyses is still promising regarding the consistent effects of the peer influence variables which are of direct interest.

#### Additional Analyses

By limiting the previous analyses of peer influence on adolescent sexual behavior, one question that arises is whether or not opposite sex best friends exert peer influence over adolescent sexual behavior in a manner similar to that of one's same sex best friend. Addressing this concern, models were run for each dependent variable on a sample of adolescents who nominated an opposite sex best friend.<sup>26</sup> Table 9 presents the results for sexual onset. Within these analyses, neither peer attitudes nor peer behaviors were significant predictors of sexual onset. Moreover, none of the interaction terms reached statistical significance. The null findings regarding the influence of peer behavior are contrary to the previously reported findings of same-sex peers. This may be an indication of priority of same-sex friends as models for future behavior.

The analyses of peer influence of an opposite sex best friend on sex with a non-romantic partner, located in Table 10, also resulted in null findings. While the

---

<sup>26</sup> Once again, the best friend was considered to be the first nominated friend per the findings of McGloin (2009).

Table 9: Fixed Effects Regression Models for Results of Peer Influence on Sexual Onset- Opposite Sex Best Friend

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.420 (.369)	1.522	.347 (.384)	1.415	.431 (.367)	1.539	.421 (.369)	1.524
<b>Peer Attitude (Sex = Attractive)</b>	.106 (.193)	1.112	.088 (.196)	1.092	-.521 (.861)	1.072	.111 (.200)	1.118
<b>Peer Behavior*Peer Attitude</b>	-	-	.409 (.391)	1.505	-	-	-	-
<b>Age</b>	.429* (.216)	1.536	.383 (.221)	1.467	.458 (.218)	1.581	.428* (.216)	1.534
<b>Female</b>	.619 (.389)	1.857	.640 (.391)	1.897	.553 (.393)	1.739	.614 (.392)	1.848
<b>Black</b>	-.431 (.844)	.650	-.504 (.857)	.604	-.521 (.861)	.594	-.443 (.854)	.642
<b>Self-Control</b>	-.273 (.157)	.761	-.280 (.158)	.757	-.262 (.159)	.770	-.275 (.158)	.759
<b>Pubertal Status</b>	.461* (.200)	1.585	.442 (.202)	1.556	.456 (.202)	1.609	.462 (.200)	1.587
<b>Parental Monitoring</b>	-.235 (.167)	.791	-.229 (.167)	.796	-.220 (.169)	.803	-.235 (.167)	.790
<b>Mom's Attitude</b>	.142 (.164)	1.152	.140 (.165)	1.150	.130 (.166)	1.139	.143 (.164)	1.154
<b>Relationship with Parents</b>	-.102 (.233)	.903	-.116 (.234)	.890	-.071 (.236)	.931	-.105 (.235)	.900
<b>Religiosity</b>	-.492* (.251)	.611	-.537* (.256)	.584	-.506* (.253)	.603	-.494* (.251)	.610
<b>Involvement</b>	.205 (.126)	1.227	.186 (.127)	1.204	.163 (.127)	1.177	.204 (.126)	1.226
<b>Peer Behavior*Involvement</b>	-	-	-	-	.394 (.246)	1.483	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.014 (.135)	.987

N = 242

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

Table 10: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside a Romantic Relationship – Opposite Sex Best Friend

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.801 (.468)	2.228	.839 (.482)	2.315	.990 (.528)	2.692	.793 (.475)	2.211
<b>Peer Attitude (Sex = Attractive)</b>	-.093 (.314)	.911	-.028 (.338)	.973	-.037 (.315)	.934	-.102 (.324)	.903
<b>Peer Behavior*Peer Attitude</b>	-	-	-.231 (.421)	.794	-	-	-	-
<b>Age</b>	-.301 (.372)	.740	-.259 (.380)	.772	-.286 (.378)	.751	-.297 (.373)	.743
<b>Female</b>	.542 (.759)	1.720	.557 (.764)	1.746	.640 (.779)	1.897	.552 (.766)	1.737
<b>Black</b>	2.031* (.966)	7.624	1.890 (1.000)	6.612	1.978 (1.015)	7.230	2.029* (.968)	7.608
<b>Self-Control</b>	.125 (.309)	1.133	.132 (.310)	1.141	.111 (.308)	1.118	.126 (.308)	1.134
<b>Pubertal Status</b>	.827* (.375)	2.287	.804* (.375)	2.235	.869* (.381)	2.384	.821* (.378)	2.272
<b>Parental Monitoring</b>	-.333 (.362)	.717	-.316 (.363)	.729	-.326 (.359)	.722	-.333 (.362)	.717
<b>Mom's Attitude</b>	.357 (.305)	1.429	.322 (.311)	1.380	.323 (.309)	1.382	.349 (.313)	1.418
<b>Relationship with Parents</b>	-.011 (.562)	.989	.027 (.575)	1.027	.038 (.558)	1.038	-.014 (.563)	.986
<b>Religiosity</b>	.107 (.565)	1.113	.132 (.572)	1.141	.273 (.600)	1.314	.108 (.566)	1.115
<b>Involvement</b>	.509* (.231)	1.664	.497* (.233)	1.644	.621* (.259)	1.861	.512* (.234)	1.669
<b>Peer Behavior*Involvement</b>	-	-	-	-		.650	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-			.022 (.198)	1.023

N = 108

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

directionality of the variables of peer influence remained the same, none of the variables of peer influence or the interaction terms of peer influence reached statistical significance. However, the positive and statistically significant relationship between peer involvement and non-romantic sexual activity is intriguing. The amount of time that an adolescent spends with his or her opposite sex best friend increases the likelihood that an adolescent will engage in sex with a non-romantic partner ( $b = .51$ ). This finding may be a result of an adolescent engaging in non-romantic sex with their opposite sex best friend. Therefore, time spent together may be an indicator of the joint sexual activities of this friendship pair instead of a predictor variable.

The results from Table 11, which examine the influence of opposite sex peers on birth control usage, present similar findings to those found in the analyses run on the original sample. None of the mechanisms of peer influence tested indicate that opposite sex peers exert any influence over one's frequency of birth control usage. Moreover, the results fail to support the hypothesis that peer involvement conditions the effect of each mechanism of peer influence.<sup>27</sup>

---

<sup>27</sup> It is possible that the null findings of peer influence on each risky sexual behavior are a result of the operationalization of peer behavior in the analysis of peer influence on risky sexual behavior. Recently, studies of peer influence have been questioned for their use of a scale or index of peer behavior as measure of peer influence. Since scales or indices of behavior do not estimate the effects of specific peer behaviors on the exact same behaviors of respondents, it has been argued that these measures may inaccurately measure the effects of peer influence on adolescent behavior. Acknowledging this criticism and taking into account the significant correlations between risky sexual behavior and peer sexual activity, the scale of risky sexual behaviors engaged in by peers was replaced by specific sexual behaviors in order to more accurately examine peer influence on specific risky sexual behavior. See Appendix A for tables. Using the peer's response to the outcome variable at wave 1, it was found that a peer's involvement in sex outside of romantic relationship increases the likelihood that an adolescent will have sex with a non-romantic partner ( $p < .05$ ) but a peer's infrequent birth control usage did not predict an adolescent's infrequent birth control usage at wave 2. Peer behavior was also operationalized as whether or not one's peer was sexually active at the first wave of data collection. The results indicate that having a peer who is sexually active increased the log odds that an adolescent would engage in sex with a non-romantic partner but this peer behavior failed to predict birth control usage by the respondent.

Table 11: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – Opposite Sex Best Friend

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior</b>	.194 (.547)	1.214	.191 (.551)	1.210	.201 (.579)	1.222	.272 (.562)	1.313
<b>Peer Attitude (Birth Control Attitude)</b>	.040 (.331)	1.040	-.009 (.381)	.991	.033 (.379)	1.033	.019 (.321)	1.019
<b>Peer Behavior*Peer Attitude</b>	-	-	.106 (.383)	1.112	-	-	-	-
<b>Age</b>	-.005 (.511)	.995	-.008 (.512)	.992	.009 (.631)	1.010	-.121 (.554)	.886
<b>Female</b>	-1.226 (.997)	.294	-1.242 (1.001)	.289	-1.236 (1.036)	.291	-1.102 (1.029)	.332
<b>Black</b>	-1.490 (1.240)	.225	-1.514 (1.251)	.220	-1.484 (1.249)	.228	-1.215 (1.268)	.297
<b>Self-Control</b>	-.347 (.495)	.707	-.335 (.493)	.715	-.348 (.496)	.706	-.282 (.518)	.754
<b>Pubertal Status</b>	-.789 (.428)	.454	-.779 (.430)	.459	-.790 (.429)	.454	-.997 (.524)	.369
<b>Parental Monitoring</b>	.057 (.531)	1.059	.102 (.555)	1.108	.059 (.534)	1.061	.054 (.525)	1.056
<b>Mom's Attitude</b>	1.491* (.632)	4.444	1.481* (.625)	4.397	1.487* (.640)	4.426	1.523* (.640)	4.587
<b>Relationship with Parents</b>	1.142 (.782)	3.132	1.123 (.789)	3.075	1.158 (.899)	3.185	1.161 (.770)	3.193
<b>Religiosity</b>	.309 (.729)	1.361	.264 (.734)	1.303	.315 (.749)	1.370	.279 (.750)	1.322
<b>Involvement</b>	-.323 (.279)	.723	-.319 (.280)	.727	-.323 (.279)	.724	-.356 (.291)	.701
<b>Peer Behavior*Involvement</b>	-	-	-	-	-.021 (.565)	.979	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	.244 (.285)	1.276

N = 49

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

## **Chapter 6: Discussion**

Giordano (2003:275) argued that specific research needs to be done in order to determine the “specific mechanisms that operate to produce...high levels of behavioral homophily” which are often cited as evidence of peer influence. This research is one attempt to illuminate the role of different mechanisms of peer influence while addressing other limitations that have plagued previous research. Building upon previous literature, three hypotheses were made regarding the nature of peer influence on sexual behavior. First, it was believed that both peer behaviors and peer attitudes would serve as mechanisms of peer influence, but only peer behaviors were a significant predictor of adolescent sexual onset. The positive effect of peer behavior did not hold for either outcome of risky sexual behavior. The remaining hypotheses guiding this research stated that the combination of peer attitudes and peer behaviors would predict adolescent sexual behavior and peer involvement would condition each mechanism of peer influence. The results from the multivariate analyses failed to support either of these claims.

This pattern of results has several implications for theories of peer influence. First, this study found that peers are not universally influential on adolescent sexual behavior as previous research has suggested. This discovery may represent a larger picture of peer influence where certain behaviors are available for discussion/influence whereas others are not. For instance, the hurdle of first having sex may be open for discussion to peers. This study suggests that peer influence for sexual onset takes the form of modeling or imitation of peer behavior. This would be in agreement with the comment of Akers (1998) that peer influence may be at its

strongest for initiation into behavior, and it is also in accordance with the previous findings of Jaccard et al. (2005) and Bearman and Bruckner (2001) who found that peer behaviors predicted sexual onset.

Once the threshold of initiation into the sexual world is met, however, adolescents may rely upon other sources of influence for sexual behavior than their best friend.<sup>28</sup> It is possible that adolescents do not turn to their peers for influence regarding more specific forms of sexual behavior because these details are not shared between friends. This would explain the findings that peers are influential for sexual onset but not for risky sexual behaviors since these more intimate details may not be shared. Therefore, it is very possible that sexual partners are the dominant source of influence for these behaviors. This line of thought is in agreement with the finding that the amount of time that an adolescent spends with his or her opposite sex best friend predicts non-romantic sexual activity. Unfortunately, testing the influence of romantic partners and sexual partners is not possible at the current time due to the restrictions of the AddHealth data which does not allow researchers to link respondent data to romantic partner/sexual partner data.

Another reason that peers may not influence risky sexual behavior is that the opportunities to engage in risky sexual behaviors are not ubiquitous. For instance, an adolescent may have knowledge of a peer's approval of risky sexual behavior or knowledge that his or her peer engages in some form of risky sexual behavior, but

---

<sup>28</sup> The finding that peers do not influence risky sexual behavior contradicts the work of Majumdar (2003). Although both studies used the AddHealth data to determine the effects of peers on risky sexual behavior, the differing findings are probably a result of differences in sampling frame and statistical power. Moreover, Majumdar (2003) used latent class analysis without listwise deletion to determine peer effects on risky sexual behaviors while this author looked at how specific risky sexual behaviors of peers influence specific types of risky sexual behaviors.

that does not mean that he or she has the opportunity to engage in the same behavior. At least one partner is required to engage in risky sexual behavior, and if an adolescent does not have the opportunity, there is no way to determine if peers exert any type of influence in this test of peer influence on adolescent behavior.

Since this research has demonstrated that peers are not a universal predictor of adolescent sexual behavior, it raises the question as to why social bonds are downplayed as significant predictors of adolescent behavior in favor of peers. This research has demonstrated that the importance of religion to an adolescent plays a large role in whether or not an adolescent will experience his or her first sex. In addition, increased levels of parental monitoring also seem to partially prevent sexual onset and risky sexual behavior. These robust and consistent findings demonstrate that social bonds should not be ignored in the study of peer influence on adolescent sexual behavior and the importance of parents and religion should be further developed in adolescent behavior research.

The finding that peers do not exert a universal effect on adolescent sexual behavior also has implications for programs aimed at reducing adolescent sexual activity. For instance, many programs such as “Above the Influence,”<sup>29</sup> often ignore sources of influence on adolescent behavior outside the realm of peers and school. This research demonstrates that if these programs wish to be more effective in reducing adolescent risk behavior (e.g., sexual behavior), they must focus on multiple causes and correlates of adolescent such as parental attitudes and religion in order to

---

<sup>29</sup> Above the Influence is a national program that attempts to help teenagers become more aware of the influences around them so that youth more carefully consider the risks of certain behaviors (Above the Influence, 2009).

prevent behaviors which may have detrimental effects on the lives of America's youth.

Another significant implication for theories of peer influence is that peer behavior emerges as a predictor of sexual onset, whereas peer attitudes do not. This result is contrary to the findings of previous researchers who have demonstrated that peer attitudes have an effect on behavior (Billy, Rodgers and Udry, 1984; Manning et al. 2005; Moore & Rosenthal, 1991; and Warr & Stafford, 1991). This noteworthy finding lends itself to multiple interpretations. First, it is plausible that it is not a peer's actual attitude that influences an adolescent; rather, it is the perception of the peer's attitude that influences adolescent sexual behavior. For instance, if an adolescent perceives his or her peers as having positive attitudes toward sexual behavior, this may lead an adolescent to engage in the behavior even if his or her peer does not actually have a favorable attitude toward sex. The argument that perceived peer attitudes matter and actual peer attitudes do not matter accounts for the significant finding of Warr and Stafford (1991) who used perceptions of peer attitudes as a mechanism of peer influence.

The null findings regarding peer attitudes as a source of peer influence may also result from an adolescent requiring more than a permissive attitude toward sexual behavior by a peer. In fact, a peer's favorable attitude toward sex may not be enough to encourage an adolescent to engage in sexual behavior. This conclusion not only undermines Differential Association Theory proposed by Sutherland (1960) because it demonstrates that providing favorable definitions (attitudes) for committing an act is not enough to explain an adolescent's future involvement in said act, but it also

raises questions as to the relevance of definitions as a element of learning in Akers's Social Learning Theory (1998).

It is also important to note that one's level of peer involvement did not play a significant role in predicting sexual behavior in this research. Although never fully outlined in Differential Association Theory or Social Learning Theory, Sutherland and Akers both suggested that the amount of time spent with peers would affect the learning of behavior. In fact, Agnew (1991) and Osgood et al. (1996) found that the amount of time spent with one's peers predicted adolescent delinquency. This research expanded upon the work of the previous authors and tested whether the amount of time that and adolescent spends with his or her peer conditions the mechanisms of peer influence. Even though peer involvement had a positive relationship with each adolescent sexual behavior, it was only a significant predictor of an opposite sex best friend's influence on sex outside of a romantic relationship. Moreover, the amount of time that a respondent spends with his or her peer failed to have a conditioning effect on either mechanism of peer influence.

As a side note, it is important to recognize that the null effect of an adolescent's involvement with a same-sex best friend in this research may be related to the sampling frame. Each respondent and his or her nominated peer attended the same school. This means that the peer dyad spends around 7 hours a day, five days a week together. At this point, it seems reasonable that the school day provides enough time to express one's attitude or relay one's involvement in sexual behaviors and no further time together is needed to influence sexual behavior. Therefore, the amount of time that peers spend together at school is sufficient enough for exert peer

influence over one another and the additional time outside of school is relatively unimportant.

Finally, it should be noted that this research is a conservative test of peer influence because it uses actual measures of peer attitudes and peer behaviors to determine whether or not peers influence the sexual behaviors of adolescents. The knowledge of actual peer attitudes and behaviors varies between peer dyads. Therefore, if discussion of specific sexual behaviors is limited, it means that there is less of a chance that adolescents are able to directly influence their peers. Consequently, the results of this project can only be generalized to how the mechanisms of actual peer attitudes and actual peer behaviors influence adolescent sexual behavior and cannot be used to make assumptions of how perceptions of peer attitudes and behaviors may influence adolescent sexual behavior.

#### *Limitations and Future Research*

While this study has some noteworthy findings regarding peer influence on adolescent sexual behavior, it is limited by the available peer measures in the AddHealth data. First, this study is restricted to those individuals who attend the same school as the respondent. Previous literature argues that peers inside of school are extremely similar to those peers outside of school (Hayne, 2001), but it is impossible to know whether or not a best friend outside of school influences an adolescent the same way as a best friend who attends the same school. Unfortunately, research that has made general conclusions about peer influence using samples of adolescents whose peers are restricted to the school population have ignored potential sources of variation in peer influence. It may be the case that peers within one's

school and peers that do not attend the same school have varying levels of influence over the behavior of an adolescent. More important to this research is the possibility that mechanisms of peer influence may operate differentially among these two groups of peers. In addition, involvement with one's peer who does not attend the same school may have an independent and/or conditioning effect on the mechanisms of peer influence, contradicting the null findings in this study. Therefore, it is imperative of future research to focus on peer relationships outside of school in order to determine their role on adolescent behavior.

This research was also limited by restricting the analysis of peer influence to one's best friend. This causes two potential problems for the current research. First, it fails to account for peer group/cliq ue influence. Often, status or popularity in adolescent relationships is derived from one's sexual behavior, and it has been shown that status is a key element in peer group relationships (Benenson, 1990; Waldrop & Halverson, 1975; Warr, 2002; Weerman & Smeenk, 2005). Therefore, if one wants to increase his or her status in a peer group or attract a member of the opposite sex, he or she may turn to others in his or her peer group in addition to the best friend for guidance on whether or not to engage in sexual behavior. This in accord with the findings of current research being conducted by McGloin et al. (2009) indicating that the peer group is more influential than the best friend.

Limiting the analysis of peer influence to one's best friend also fails to account for the influence of a romantic partner. It is very likely that one's romantic partner exerts a significant amount of influence as to whether or not an adolescent decides to engage in his or her first sex and risky sexual behavior. No previous

research known to this author has compared the influence of a peer to a romantic partner; therefore, the effect of a romantic partner's influence on peer influence remains unknown. Since access to respondent's romantic partners is currently restricted by AddHealth organizers, testing the exact nature of romantic partner influence and comparing it to peer influence on adolescent sexual behavior will have to wait.

In the future, research on peer influence would greatly benefit from building off of the work of this author and others by directly comparing actual peer behaviors and perceptions of peer behaviors as mechanisms of peer influence. While Gottfredson and Hirschi (1990) argue that perceptions of peer behaviors are merely projections of respondent behaviors, this point is still up for debate. Future research should not only attempt to disentangle perceptions of peer behaviors from projections of peer behaviors, but it should also examine the importance of perceptions of peer behavior. This line of research is especially important given that adolescent behavior plays a large role in status seeking for adolescent relationships. Both perceptions and actual behavior may motivate an adolescent to engage in a behavior that he or she sees as means to achieving a greater level of status. While actual peer behavior may be implicit as a modeling mechanism, perceptions of behavior are not as direct. Even though a peer may or may not be engaging in sexual behavior, a respondent who perceives that a peer is having sex may serve as the model/reinforcement needed for one to decide to engage in sexual activity. Existing literature on peer influence will greatly benefit from a deeper understanding of how perceptions and actual peer

behavior influence adolescent behavior in addition to determining how the two directly compare to one another

## **Chapter 7: Conclusion**

This study is one attempt to make sense of the puzzles surrounding the mechanisms of peer influence. Beginning with the early critics of Differential Association/Social Learning Theory, many have found fault with these theories based on their ambiguous description of the mechanisms of peer influence. In a comparative test of two mechanisms of peer influence, peer attitudes and peer behaviors, this research has shown that peer behaviors are a better predictor of adolescent sexual behavior compared to peer attitudes. Moreover, the mechanisms are not conditioned by one another nor are they conditioned by one's level of peer involvement. While this study is not able to completely explain how the mechanisms of peer influence operate, it does provide future research with a guide on where to focus when continuing to examine the complexity of peer influence. Even though this research did not provide a critical test ruling out the possibility of peer attitudes having an influence on adolescent behavior, future research should take note of the importance of peer behaviors over peer attitudes in predicting adolescent behavior and, with this small yet significant puzzle piece, continue to answer the numerous questions that Differential Association/Social Learning theory generate regarding peer influence.

## Appendix

Table 12: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside a Romantic Relationship – Re-specified Using Specific Behavior

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR
<b>Peer Behavior (Sex Outside Relationship)</b>	.609* (.264)	1.839	.549* (.274)	1.731	.600* (.271)	1.821	.616* (.247)	1.852
<b>Peer Attitude (Sex = Attractive)</b>	.112 (.139)	1.119	.056 (.149)	1.057	.111 (.139)	1.118	.130 (.141)	1.139
<b>Peer Behavior*Peer Attitude</b>	-	-	.292 (.276)	1.340	-	-	-	-
<b>Age</b>	.229 (.133)	1.257	.232 (.133)	1.262	.229 (.133)	1.257	.238 (.133)	1.268
<b>Female</b>	-.140 (.268)	.869	-.143 (.269)	.867	-.137 (.269)	.872	-.150 (.269)	.861
<b>Black</b>	.884* (.411)	2.420	.940* (.415)	2.561	.875 (.415)	2.399	.869* (.411)	2.384
<b>Self-Control</b>	-.130 (.110)	.878	-.132 (.110)	.876	-.129 (.110)	.879	-.131 (.110)	.877
<b>Pubertal Status</b>	.096 (.115)	1.100	.092 (.114)	1.096	.095 (.115)	1.100	.097 (.115)	1.102
<b>Parental Monitoring</b>	-.291* (.133)	.749	-.304* (.134)	.738	-.291* (.133)	.749	-.289 (.133)	.749
<b>Mom's Attitude</b>	.148 (.113)	1.160	.154 (.113)	1.167	.148 (.113)	1.159	.148 (.113)	1.160
<b>Relationship with Parents</b>	.469 (.271)	1.599	.444 (.273)	1.559	.468 (.271)	1.597	.478 (.273)	1.612
<b>Religiosity</b>	-.301 (.176)	.740	-.317 (.176)	.729	-.299 (.176)	.741	-.296 (.176)	.743
<b>Involvement</b>	.083 (.086)	1.087	.077 (.086)	1.081	.080 (.185)	1.084	.094 (.088)	1.099
<b>Peer Behavior*Involvement</b>	-	-	-	-	.030 (.139)	1.031	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.069 (.090)	.934

N = 495

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

Table 13: Fixed Effects Regression Models for Results of Peer Influence on Infrequent Birth Control Usage – Re-specified Using Specific Behavior

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior (Birth Control Usage)</b>	-.172 (.816)	.842	-.271 (.818)	.763	.131 (.933)	1.140	-.089 (.818)	.915
<b>Peer Attitude (Birth Control Attitude)</b>	-.287 (.224)	.751	-.270 (.224)	.763	-.264 (.223)	.768	-.214 (.236)	.807
<b>Peer Behavior*Peer Attitude</b>	-	-	.592 (.741)	1.808	-	-	-	-
<b>Age</b>	-.422 (.283)	.656	-.409 (.284)	.664	-.379 (.289)	.684	-.437 (.287)	.646
<b>Female</b>	-.762 (.510)	.467	-.743 (.513)	.476	-.798 (.514)	.450	-.815 (.518)	.443
<b>Black</b>	-2.039* (.805)	.130	-2.146* (.822)	.117	-1.987* (.806)	.137	-2.000* (.815)	.136
<b>Self-Control</b>	.057 (.216)	1.059	.075 (.218)	1.078	.041 (.218)	1.042	.067 (.217)	1.069
<b>Pubertal Status</b>	-.369* (.188)	.691	-.386* (.190)	.680	-.381* (.190)	.623	-.336 (.192)	.715
<b>Parental Monitoring</b>	.214 (.241)	1.239	.193 (.243)	1.213	.234 (.245)	1.264	.262 (.248)	1.300
<b>Mom's Attitude</b>	.192 (.233)	1.212	.202 (.235)	1.223	.155 (.235)	1.168	.158 (.236)	1.171
<b>Relationship with Parents</b>	-.272 (.384)	.762	-.275 (.384)	.760	-.261 (.383)	.770	-.304 (.384)	.738
<b>Religiosity</b>	-.481 (.304)	.618	-.476 (.305)	.621	-.520 (.308)	.594	-.514 (.309)	.598
<b>Involvement</b>	-.018 (.161)	.982	-.019 (.162)	.981	-.067 (.169)	.935	.024 (.168)	1.025
<b>Peer Behavior*Involvement</b>	-	-	-	-	-.981 (.792)	.375	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.123 (.140)	.884

N = 111

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

Table 14: Fixed Effects Regression Models for Results of Peer Influence on Sex Outside a Romantic Relationship – Re-specified to General Sexual Behavior

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR	$\beta$ (SE)	OR
<b>Peer Behavior (Sexually Active)</b>	.632** (.215)	1.881	1.618** (.593)	5.045	.101 (.509)	1.106	.623** (.215)	1.875
<b>Peer Attitude (Sex = Attractive)</b>	.117 (.113)	1.124	.350* (.173)	1.419	.117 (.114)	1.124	.306 (.252)	1.358
<b>Peer Behavior*Peer Attitude</b>	-	-	-.398 (.221)	.672	-	-	-	-
<b>Age</b>	.194 (.113)	1.214	.193 (.114)	1.213	.197 (.114)	1.217	.199 (.114)	1.221
<b>Female</b>	-.057 (.228)	.945	-.051 (.093)	.951	-.052 (.228)	.949	-.054 (.228)	.947
<b>Black</b>	.951** (.357)	2.588	.914* (.360)	2.493	.938** (.357)	2.555	.944** (.357)	2.570
<b>Self-Control</b>	-.117 (.095)	.889	-.125 (.095)	.883	-.114 (.095)	.892	-.117 (.095)	.890
<b>Pubertal Status</b>	.067 (.096)	1.069	.071 (.097)	1.073	.064 (.096)	1.066	.067 (.096)	1.070
<b>Parental Monitoring</b>	-.157 (.110)	.855	-.136 (.111)	.873	-.162 (.111)	.851	-.158 (.110)	.854
<b>Mom's Attitude</b>	.144 (.095)	1.155	.136 (.095)	1.146	.135 (.095)	1.145	.149 (.095)	1.160
<b>Relationship with Parents</b>	.297 (.209)	1.346	.286 (.208)	1.331	.275 (.210)	1.317	.308 (.210)	1.361
<b>Religiosity</b>	-.130 (.146)	.878	-.117 (.146)	.889	-.131 (.145)	.877	-.125 (.146)	.882
<b>Involvement</b>	.081 (.071)	1.084	.082 (.072)	1.086	-.006 (.103)	.994	.226 (.188)	1.253
<b>Peer Behavior*Involvement</b>	-	-	-	-	.160 (.139)	1.173	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.057 (.068)	.944

N = 691

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

Table 15: Fixed Effects Regression Models for Results of Peer Influence on Birth Control Usage – Re-specified to General Sexual Behavior

Variable	Model 1		Model 2		Model 3		Model 4	
	$\beta$ (SE)	OR						
<b>Peer Behavior (Sexually Active)</b>	-.289 (.275)	.749	-.203 (.538)	.817	-.277 (.692)	.758	-.263 (.277)	.769
<b>Peer Attitude (Birth Control Attitude)</b>	-.173 (.115)	.840	-.149 (.175)	.861	-.174 (.115)	.840	.264 (.287)	1.302
<b>Peer Behavior*Peer Attitude</b>	-	-	-.043 (.232)	.958	-	-	-	-
<b>Age</b>	-.014 (.148)	.986	-.013 (.148)	.987	-.014 (.148)	.986	-.009 (.149)	.991
<b>Female</b>	-.216 (.292)	.806	-.224 (.295)	.799	-.216 (.292)	.806	-.224 (.295)	.799
<b>Black</b>	-.815 (.461)	.443	-.808 (.463)	.446	-.815 (.461)	.443	-.710 (.469)	.492
<b>Self-Control</b>	-.068 (.118)	.934	-.070 (.119)	.932	-.068 (.118)	.934	-.060 (.120)	.942
<b>Pubertal Status</b>	-.154 (.116)	.857	-.154 (.116)	.857	-.154 (.116)	.857	-.142 (.117)	.868
<b>Parental Monitoring</b>	-.025 (.139)	.975	-.026 (.140)	.974	-.025 (.140)	.975	-.006 (.141)	.994
<b>Mom's Attitude</b>	-.021 (.130)	.979	-.017 (.131)	.983	-.021 (.130)	.980	-.050 (.132)	.951
<b>Relationship with Parents</b>	.229 (.230)	1.257	.233 (.231)	1.263	.229 (.231)	1.257	.223 (.230)	1.250
<b>Religiosity</b>	-.297 (.180)	.743	-.295 (.180)	.744	-.297 (.180)	.743	-.287 (.181)	.751
<b>Involvement</b>	.010 (.094)	1.010	.010 (.094)	1.010	.012 (.139)	1.012	.285 (.192)	1.330
<b>Peer Behavior*Involvement</b>	-	-	-	-	-.003 (.181)	.997	-	-
<b>Peer Attitude*Involvement</b>	-	-	-	-	-	-	-.126 (.076)	.882

N = 280

\* p < .05 (two-tailed test)

\*\* p < .01 (two-tailed test)

## Bibliography

- Above the Influence. 2009. Retrieved from <http://www.abovetheinfluence.com/>.
- Agnew, Robert. 1991. The interactive effect of peer variables on delinquency. *Criminology*, 29: 47-72.
- Akers, Ronald L. 1998. *Social Learning and Social Structure: A general theory of crime and deviance*. Boston: Northeastern University Press.
- Armour, Stacy, and Dana L. Haynie. 2007. Adolescent sexual debut and later delinquency. *Journal of Youth Adolescence*. 36:141-152.
- Bank, Barbara J. and Suzanne L. Hansford. 2000. Gender and friendship: why are men's best same-sex friendships less intimate and supportive?. *Personal Relationships*. 7:63-78.
- Barnes, Grace M., Hoffman, Joseph H., Welte, John W., Farrell, Michael P. and Barbara A Dincheff. 2007. Adolescents' time use: Effects on substance abuse, delinquency, and sexual activity. *Journal of Youth and Adolescence*, 36:697-710.
- Benenson, Joyce F. 1990. Gender differences in social networks. *Journal of Early Adolescence*, 10(4): 472-495.
- Biglan, Anthony., Metzler, Carol W., Wirt., Roger., Ary. Dennis., Noel John., Ochs, Linda., French, Christine and Don Hood. 1990. Social and behavioral factors associated with high-risk sexual behavior among adolescents. *Journal of Behavioral Medicine*. 13(3): 245-261.
- Bearman, Peter and Hannah Brückner. 1999. Peer effects on adolescent sexual debut and pregnancy: an analysis of a national survey of adolescent girls, in: *Peer Potential: Making the Most of How Teens Influence Each Other*, Washington, DC: National Campaign to Prevent Teen Pregnancy, pp. 7-26.
- Berndt, Thomas J. 1996 Transitions in friendship and friend's influence. In Graber, Julia A., Brooks-Gunn, Jeanne. and Anne C. Peterson (Eds.) *Transitions through Adolescence: Interpersonal Domains and Context*. New York: Lawrence Erlbaum Associates.
- Billy, John O.G. and J. Richard Udry. 1985. Patterns of adolescent friendship and effects on sexual behavior. *Social Psychology Quarterly*. 48(1): 27-41.
- Billy, John O.G., Rodgers, Joseph Lee, and J. Richard Udry. 1984. Adolescent sexual behavior and friendship choice. *Social Forces*, 62:3, 653-678.

- Blythe, D.A., Hill, J.P. and K.S. Theil. 1982. Early adolescent's significant others: grade and gender differences in perceived relationships with familial and nonfamilial adults. *Journal of Youth and Adolescence*. 11: 425-445.
- Brooks-Gunn, Jeanne and Frank F. Furstenberg, Jr. 1989. Adolescent Sexual Behavior. *American Psychologist*, 44(2):249-257.
- Burgess, Robert L. and Ronald L. Akers. 1966. A differential association-reinforcement theory of criminal behavior. *Social Problems*. 14(2): 128-147.
- Busseri, Michael A., Willoughby, Teena and Heather Chambers. 2007. A rationale and method for examining reasons for linkages among adolescent risk behaviors. *Journal of Youth and Adolescence*, 36:279-289.
- Center for Disease Control. Sexual Risky Behaviors. Retrieved from [www.cdc.gov/HealthyYouth/sexualbehaviors/](http://www.cdc.gov/HealthyYouth/sexualbehaviors/) on October 23, 2008.
- Center for Disease Control. 2006. Trends in HIV-related risk behaviors among high school students-United States, 1991-2005. *Morbidity & Mortality Weekly Report*. 55(31): 851-854.
- Center for Disease Control. 2007. Prevalence of HPV infection among sexual active females aged 14-59 years, by age group-National Health and Nutrition Examination Survey, United States, 2003-2004. *Morbidity & Mortality Weekly Report*. 56(33): 852.
- Chamberlain, Gary. 1982. Analysis of Covariate with Qualitative Data. NBER Working Paper Series, Vol. W0325, Available at SSRN: <http://ssrn.com/abstract=260503>.
- Chantala, Kim and Joyce Tabor. 1999. Strategies to perform a design-based analysis using the Add Health Data. Available at <http://www.cpc.und.edu/projects/addhealth/data/using/guides/weight.1pdf>
- Cohen, Jere. 1983. Commentary: the relationship between friendship selection and peer influence. In Epstein, Joyce Levy and Nancy Karweit (Eds.) *Friends in School: Patterns of Selection and Influence in Secondary Schools*. New York: Academic Press.
- Combs-Lane, A. M.,& Smith, D. W. 2002. Risk of sexual victimization in college women: The role of behavioral intentions and risk-taking behaviors. *Journal of Interpersonal Violence*. 17, 165-183

- DeKemp, Raymond A.T., Scholte, Ron H., Overbeek, Geertjan. and Rutger C.M.E. Engels. 2006. Early adolescent delinquency: the role of parents and best friends. *Criminal Justice and Behavior*. 33(4):488-510.
- Dekovic, Maja. 1999. Risk and protective factors in the development of problem behavior during adolescence. *Journal of Youth and Adolescence*. 28(6): 667-685.
- Dindia, Kathryn and Mike Allen. 1992. Sex differences in self-disclosure: a meta-analysis. *Psychological Bulletin*. 112(1): 106-124.
- Evans, T. David., Cullen, Francis T., Burton, Velmer S. Jr., Dunaway, R. Gregory, and Michael L. Benson. 1997. The social consequences of self-control: testing the general theory of crime. *Criminology*. 35(3): 475-504.
- Felson, Richard B., and Dana L. Haynie. 2002. Pubertal development, social factors, and delinquency among adolescent boys. *Criminology*, 40(4):967-988.
- Garnier, Helen E. and Judith A. Stein. 2002. An 18-year model of family and peer effects on adolescent drug use and delinquency. *Journal of Youth and Adolescence*. 31(1): 45-56.
- Giordano, Peggy. 2003. Relationships in adolescence. *Annual Review of Sociology*, 29: 257-281.
- Giordano, Peggy C., Cernkovich, Stephen A., and M.D. Pugh. 1986. Friendships and Delinquency. *The American Journal of Sociology*. 91(5): 1170-1202.
- Gottfredson, Michael, and Travis Hirschi. 1989. A propensity-event theory of crime. In Laufer, William S. and Freda Adler (Eds.). *Advances in Criminological Theory (Volume 1)*. New Brunswick, NJ: Transaction Books
- Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford: Stanford University Press.
- Greene, William H. 2003. *Econometric Analysis, Fifth Edition*. Prentice Hall, Upper Saddle River, NJ
- Guillamo-Ramos, Vincent, Jaccard, James, Dittus, Patricia, Gonzalez, Bernardo and Alida Bouris. 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.
- Hartup, Willard W. 2005. Peer interaction: what causes what?. *Journal of Abnormal Child Psychology*. 33(3): 387-394.

- Hampton, Mary Rucklos, Jeffrey, Bonnie, McWatters, Barb and Pamela Smith. 2005. Influence of teens' perceptions of parental disapproval and peer behaviour on their initiation of sexual intercourse. *The Canadian Journal of Human Sexuality*, 14(3-4):105-121.
- Hay, Carter and Walter Forrest. 2006. The development of self-control: examining self-control theory's stability thesis. *Criminology*, 44(4):739-774.
- Henrich, Christopher C., Brookmeyer, Kathryn A., Shrier, Lydia A., and Golan Shahar. 2006. Supportive relationships and sexual risk behavior in adolescence: an ecological-transactional approach. *Journal of Pediatric Psychology*. 31(3): 286-297.
- Jaccard, James. Blanton, Hart and Tonya Dodge. 2005. Peer influences on risk behavior: an analysis of the effects of a close friend. *Developmental Psychology*. 41(1): 135-147.
- Jeffery, C.R. 1965. Criminal behavior and learning theory. *The Journal of Criminal Law, Criminology, and Police Science*. 56:294-300.
- Jensen, Gary F. 1972. Peers and delinquent action: a test of Differential Association perspective. *The American Journal of Sociology*. 78(3): 562-575.
- Johnson, Katherine A. and Kimberly A. Tyler. 2007. Adolescent sexual onset: an intergenerational analysis. *Journal of Youth and Adolescence*, 36:939-949.
- Karweit, Nancy and Stephen Hansell. 1983 Sex Differences in Adolescent Relationships: Friendship and Status. In Epstein, Joyce Levy and Nancy Karweit (Eds.), *Friends in School: Patterns of Selection and Influence in Secondary Schools* (pp.115-128). New York: Academic Press.
- Kinsman, Sara B., Romer, Daniel., Furstenburg, Frank F., and Donald F. Schwartz. 1998. Early sexual initiation: the role of peer norms. *Pediatrics*. 102(5): 1185-1192.
- Kirby, D. 2002. Antecedents of adolescent initiation of sex, contraceptive use, and pregnancy. *American Journal of Health Behavior*, 26(6): 473-485
- Lammers, Cristina, Ireland, Marjorie, Resnick, Michael and Robert Blum. 2000. Influences on adolescent's decision to postpone onset of sexual intercourse: a survival analysis of virginity among youths aged 13-18 years. *Journal of Adolescent Health*, 26:42-48.
- Leftowitz, Eva S., Boone, Tanya L., and Cindy L. Shearer. 2004. Communication with best friends about sex-related topics during emerging adulthood. *Journal of Youth and Adolescence*. 33(4): 339-351.

- Lohman, Brenda J. and Amanda Billings. 2008. Protective and risk factors associated with adolescent boys' early sexual debut and risky sexual behaviors. *Journal of Youth and Adolescence*, 37:723-735.
- Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications.
- Longmore, Monica A., Manning, Wendy D., and Peggy C. Giordano. (working paper). Identity exploration and adolescent's high risk sexual behaviors: A longitudinal analysis. *Working Paper Series*. 6:16, retrieved on November 3, 2008.
- Luster, Tom and Stephen A. Small. 1994. Factors associated with sexual risk-taking behaviors among adolescents. *Journal of Marriage and the Family*. 56:622-632.
- Manning, Wendy D., Longmore, Monica A., and Peggy C. Giordano. 2005. Adolescent's involvement in non-romantic sexual activity. *Social Science Research*. 34:384-407.
- Majumdar, Debarun. 2003. Understanding the dimensions of parental and peer influence on risky sexual behaviors among adolescents. American Sociological Association, Conference Paper. Atlanta, Georgia. pp.1-30.
- Matsueda, Ross L., and Kathleen Anderson. 1998. The dynamics of delinquent peers and delinquent behavior. *Criminology*. 36(2): 269-308.
- McCarthy, Bill, Femlee, Diane and John Hagan. 2004. Girl friends are better: gender, friends, and crime among school and street youth. *Criminology*, 42(4): 805-835.
- McGloin, Jean Marie. 2009. Delinquency balance: Revisiting peer influence. *Criminology*, 47(2):101-140.
- McGloin, Jean Marie and Lauren O'Neill Shermer. 2009. Self-control and deviant peer network structure. *Journal of Research in Crime and Delinquency*, 46:35-72.
- McGloin, Jean Marie. Simpson, Sally S. and Megan Bears. 2009. Gender and the locus of peer influence. Presented at the ACJS Annual Meeting, March 12, 2009.
- McNelles, Laurie R. and Jennifer A. Connolly. 1999. Intimacy between adolescent friends: age and gender differences and intimate behaviors. *Journal of Research on Adolescence*. 9(2): 143-159.

- Metzler, Carol W. Noell, John. Biglan, Anthony. Ary, Dennis and Keith Smolkowski. 1994. The social context for risky sexual behavior among adolescents. *Journal of Behavioral Medicine*. 17(4): 419-428.
- Mirande, Alfred M. 1968. Reference group theory and adolescent sexual behavior. *Journal of Marriage and the Family*, November: 572-577.
- Montemayor, Raymond and Roger Van Komen. 1985. The development of sex differences in friendship patterns and peer group structure during adolescence. *Journal of Early Adolescence*. 5(3): 285-294.
- Morgan, Mark. and Joel W. Grube. 1991. Closeness and peer group influence. *British Journal of Social Psychology*. 30:159-169.
- Moore, Susan and Doreen Rosenthal. 1991. Adolescent's perceptions of friends' and parents' attitudes to sex and sexual-risk taking. *Journal of Community and Applied Social Psychology*. 1:189-200.
- Moore, Susan and Doreen Rosenthal. 1993. *Sexuality in Adolescence*. New York: Routledge.
- Nahom, Deborah, Wells, Elizabeth, Gillmore, Mary Rogers, Hooper, Marilyn, Morrison, Diane M., Archibald, Matthew, Murowchick, Elise, Eilscon, Anthony and Laurie Graham. 2001. Differences by gender and sexual experience in adolescent sexual behavior: Implications for education and HIV prevention. *Journal of School Health*, 71(4):153-158.
- Paternoster, Raymond and Robert Brame. 1998a. The structural similarity of processes generating criminal and analogous behaviors. *Criminology*, 36(3):633-670.
- Paternoster, Raymond and Greg Pogarsky. (Working Paper). Rational choice, agency, and thoughtfully reflective decision making: The short and long-term consequences of making good choices. Provided by email February 24, 2009.
- Peterson, Anne C. and Brandon Taylor. 1980. The biological approach to adolescence. In Joseph Adelson (ed.), *Handbook of Adolescent Psychology*. New York: Wiley.
- Piquero, Nicole Leeper, Gover, Angela R., MacDonald, John M., and Alex R. Piquero. 2005. The influence of delinquent peers on delinquency: Does gender matter? *Youth Society*. 36(3): 251-275.

- Pratt, Travis C., and Francis T. Cullen. 2000. The empirical status of Gottfredson and Hirschi's General Theory of Crime: a meta-analysis. *Criminology*. 38(3): 931-964.
- Reinberg, Steven. 2007. Teen birth rates up for first time in 14 years. *US News and World Report*. December 5, 2007 retrieved from [www.health.usnews.com/usnews/health/healthday/071205/teen-birth-rates](http://www.health.usnews.com/usnews/health/healthday/071205/teen-birth-rates)
- Regan, Pamela C., Durvasula, Ramani, Howell, Lisa, Ureno, Oscar, and Martha Rea. 2004. Gender, ethnicity, and the developmental timing of first sexual and romantic experiences. *Social Behavior and Personality*, 32:667-76
- Reiss, I.L. 1967. *The Social Context of Premarital Sexual Permissiveness*. New York: Holt, Reinhart and Winston.
- Rosenthal, Doreen, Moore, Susan, and Irene Flynn. 1991. Adolescent self-efficacy, self-esteem and sexual risk-taking. *Journal of Community and Applied Social Psychology*. 1, 77-88.
- Simpson, Sally S. and Lori Elis. 1995. Doing gender: Sorting out the caste and crime conundrum. *Criminology*, 33(1): 47-81.
- Sheets, Virgil L. and Robyn Lugar. 2005 Friendship and gender in Russia and the United States. *Sex Roles*. 52(1): 131-140
- Sutherland, Edwin H. and Donald R. Cressey. 1960. *Principles of Criminology* (6<sup>th</sup> Edition). New York: J.B. Lippincott Company.
- Treboux, Dominique and Nancy A. Busch-Rossnagel. 1995. Age differences in parent and peer influences on female sexual behavior. *Journal of Research on Adolescence*, 5(4): 469-487.
- Turner, C. F, Forsyth, B. H., O'Reilly, J., Cooley, P. C., Smith, T. K., Rogers, S. M., & H. G. Miller. 1998. Automated self-interviewing and the survey measurement of sensitive behaviors. In M. P. Couper, R. P. Baker, J. Bethlehem, C. Z. Clark, J. Martin, W. Nicholls, & J. M. O'Reilly (Eds.), *Computer-assisted survey information collection*. New York: Wiley and Sons, Inc.
- Urberg, Kathryn A. 1992. Locus of peer influence: social crowd and best friend. *Journal of Youth and Adolescence*. 21(4): 439-451.
- Waldrop, Mary F. and Charles F. Halverson, Jr. 1975. Intensive and extensive peer behavior: longitudinal and cross-sectional analysis. *Child Development*, 46:19-26.
- Warr, Mark. 1993 Age, peers, and delinquency. *Criminology*. 31(1): 17-40.

- Warr, Mark. 2002. *Companions in Crime*. New York: Cambridge University Press.
- Whitaker, Daniel J. and Kim S. Miller. 2000. Parent-adolescent discussions about sex and condoms: impact on peer influences of sexual risk behavior. *Journal of Adolescent Research*, 15(2): 251-273.
- Weerman, Frank M. and Wilma H. Smeenk. 2005. Peer similarity in delinquency for different types of friends. A comparison using two measurement methods. *Criminology*, 43: 499-524.
- Werner-Wilson, Ronald Jay. 1998. Gender differences in adolescent sexual attitudes: the influence of individual and family factors. *Adolescence*, 33(131): 519-532.
- Whitbeck, Les B., Simons, Ronald L. and Meei-Ying Kao. 1994. The effects of divorced mothers' dating behaviors and sexual attitudes on the sexual attitudes and behaviors of their adolescent children. *Journal of Marriage and the Family*, 56:615-621.
- Whitley, Bernard F. Jr. 1998. False consensus on sexual behavior among college women: comparison of four theoretical explanations. *The Journal of Sex Research*, 35(2): 206-214.
- Wickström, Per-Olof H. 2006. Individuals, settings, and acts of crime: situational mechanisms and the explanation of crime. In Wickström, Per-Olof H. and Robert J. Sampson (Eds.), *The Explanation of Crime: Context, Mechanisms, and Development* (pp.61-106). New York: Cambridge University Press.
- Williams, Joanne M. and Lillian C. Dunlop. 1999. Pubertal timing and self-reported delinquency among male adolescents. *Journal of Adolescence*, 22:157-171.
- Woodruff, J. Timothy. 1986. Reference groups, religiosity and premarital sexual behavior. *Journal for the Scientific Study of Religion*, 25(4):436-4.