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# Effects of Adolescent Depressive Symptoms, Pubertal Development, and Interpersonal Relationship Satisfaction on Sexual Risk Behaviors in Adolescent Romantic Couples

Rona Carter

*Florida International University, rcart003@fiu.edu*

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

EFFECTS OF ADOLESCENT DEPRESSIVE SYMPTOMS, PUBERTAL  
DEVELOPMENT, AND INTERPERSONAL RELATIONSHIP SATISFACTION  
ON SEXUAL RISK BEHAVIORS IN ADOLESCENT ROMANTIC COUPLES

A dissertation submitted in partial fulfillment of the  
requirements for the degree of  
DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

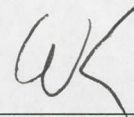
Rona Carter

2009

To: Dean Kenneth Furton  
College of Arts and Sciences

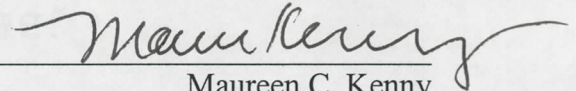
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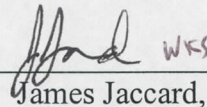
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William M. Kurtines



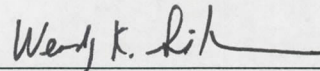
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Maureen C. Kenny



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James Jaccard, Co-Major Professor

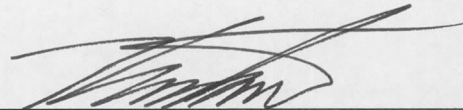


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Wendy K. Silverman, Co-Major Professor

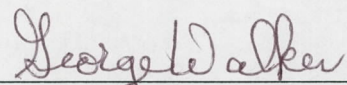
Date of Defense: July 24, 2009

The dissertation of Rona Carter is approved.



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Dean Kenneth Furton  
College of Arts and Sciences



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Dean George Walker  
University Graduate School

Florida International University, 2009

## DEDICATION

This dissertation is dedicated to the memory of my father who has been an invisible presence during the composition of these pages. I also dedicate this dissertation to my mother and the people in my social network who have walked hand-in-hand with me during this long and spirited journey and whose faith in simple dreams and insistence on small miracles put me on a path towards a research career in developmental psychology.

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ABSTRACT OF THE DISSERTATION

EFFECTS OF ADOLESCENT DEPRESSIVE SYMPTOMS, PUBERTAL  
DEVELOPMENT, AND INTERPERSONAL RELATIONSHIP SATISFACTION  
ON SEXUAL RISK BEHAVIORS IN ADOLESCENT ROMANTIC COUPLES

by

Rona Carter

Florida International University, 2009

Miami, Florida

Professor James Jaccard, Co-Major Professor

Professor Wendy K. Silverman, Co-Major Professor

This study examined links between adolescent depressive symptoms, actual pubertal development, perceived pubertal timing relative to one's peers, adolescent-maternal relationship satisfaction, and couple sexual behavior. Assessments of these variables were made on each couple member separately and then these variables were used to predict the sexual activity of the couple. Participants were drawn from the National Longitudinal Study of Adolescent Health (Add Health; Bearman et al., 1997; Udry, 1997) data set ( $N = 20,088$ ; aged 12-18 years).

Dimensions of adolescent romantic experiences using the total sample were described and then a subsample of romantically paired adolescents ( $n = 1,252$ ) were used to test a risk and protective model for predicting couple sexual behavior using the factors noted above. Relevant measures from the Wave 1 Add Health measures were used. Most of the items used in Add Health to assess romantic relationship experiences, adolescent depressive symptoms, pubertal development (actual and

perceived), adolescent-maternal relationship satisfaction, and couple sexual behavior were drawn from other national surveys or from scales with well documented psychometric properties.

Results demonstrated that romantic relationships are part of most adolescents' lives and that adolescents' experiences with these relationships differ markedly by age, sex, and race/ethnicity. Further, each respective couple member's pubertal development, perceived pubertal timing, and maternal relationship satisfaction were useful in predicting sexual risk-promoting and risk-reducing behaviors in adolescent romantic couples. Findings in this dissertation represent an initial step toward evaluating explanatory models of adolescent couple sexual behavior.



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## CHAPTER I

### INTRODUCTION

It is well known that romantic and sexual interests become more salient and common during adolescence (Brown, Feiring, & Furman, 1999; Phinney, Jensen, Olsen, & Cundick, 1990; Zimmer-Gembeck, 1999). Dating and romantic relationships are main topics of conversation among adolescents and their peers (Larson, Clore, & Wood, 1999), and many adolescents become romantically involved with the opposite sex before finishing middle school (Kann et al., 1998; Katchadourian, 1990). Dating and romantic relationships also promote the onset and patterns of sexual behavior during adolescence. For example, adolescents who appear more physically mature seem to prompt certain responses from their social environment resulting in increased opportunities for romantic and sexual involvement (Brooks-Gunn & Paikoff, 1997; Graber, Brooks-Gunn, & Galen, 1998).

At the same time, there are individual differences in the development of romantic relationships and in the timing of first sexual involvement such as the onset of first romantic sexual activities (e.g., holding hands, kissing) or the timing of pubertal development (Bingham & Crockett, 1996; Kann et al., 1998; Zimmer-Gembeck, 1999; Zimmer-Gembeck, Siebenbruner, & Collins, 2001). For example, in a nationally representative survey of adolescent females, girls reported beginning to date about 2.5 years after menarche onset (Phinney et al., 1990). In a longitudinal study of Finnish eighth grade girls, 70% of girls that experienced menarche at age 12 or earlier were dating at age 16, while only 48% of girls who experienced menarche at age 14 or later were dating at this age (Aro & Tiapale, 1987). Thus, individual

differences may interact to create an increasingly complex environment that exposes adolescents to a broad range of stressors and challenges relating to romantic and sexual interests.

### *Stressors and Challenges Relating to Romantic and Sexual Interests*

Qualitative studies with diverse groups of adolescents (Aneshensel & Gore, 1992; Martin, 1996; Thompson, 1995) suggest that the transition to dating and the role restructuring that accompanies this transition can be distressing. In addition, rejection and breakups are often repeatedly experienced as romantic relationships come and go during adolescence. These experiences can challenge adolescents' coping skills and self-concepts, particularly among adolescent girls who begin to date early (i.e., before age 14) or who date frequently (e.g., Carlson & Rose, 2007; Davies & Windle, 2000; Davila, 2007; Davila, Steinberg, Kachadourian, Cobb, & Fincham, 2004; Joyner & Udry, 2000; Larson & Asmussen, 1991; Monroe, Rhode, Seeley, & Lewinsohn, 1999; Quatman, Sampson, Robinson, & Watson, 2001). For example, in a cross-sectional study of early-adolescent girls ( $N = 96$ ; mean age = 13.24 years), Davila et al. (2004) found that girls who reported current or past involvement in a romantic relationship reported greater depressive symptoms than girls with no romantic involvement.

Monroe et al. (1999) found that thinking about relationship disturbances was linked to depressed mood, especially among girls. Past research also suggests that the nature and extent of the link between romantic involvement and negative psychosocial adjustment may depend on the type of romantic involvement. For

example, in a cross-sectional study of third, fifth, seventh, and ninth grade youths ( $N = 1510$ ), Carlson and Rose (2007) found that youths with nonreciprocal relationships compared to youths with reciprocal relationships and no relationships reported significantly higher levels of depressive and anxiety symptoms.

In addition to links between romantic involvement and negative psychosocial adjustment, adolescents are at high risk for a number of negative health outcomes associated with romantic and sexual involvement, including infection with human immunodeficiency virus (HIV), other sexually transmitted diseases (e.g., herpes, syphilis), and unintended pregnancy (Center for Disease Control (CDC), 2007). According to the 2007 Youth Risk Behavior Survey data, nearly one half (48%) of high school students in the United States reported having had sexual intercourse, with 7% having initiated before the age of 13 (CDC, 2007). Early initiation of sexual intercourse is more prevalent among males, with 10% of males compared to 4% of females reporting having had sexual intercourse before the age of 13 (CDC, 2007). Beyond early initiation of sexual intercourse, 15% of high school students report having sexual intercourse with four or more persons during their life; 38% report not using a condom during last sexual intercourse; and 84% report not using birth control pills to prevent pregnancy before last sexual intercourse (CDC, 2007). Statistics such as these highlight the fact that many adolescents are at significant risk for a number of negative health outcomes associated with early and unsafe sexual activity.

Taken together, adolescents' may encounter stressors relating to romantic involvement that negatively impact their psychosocial adjustment, such as engaging in a relationship that is not acknowledged by both partners (i.e., non-reciprocated

relationships). These stressors may influence adolescents' decisions to become sexually active and, subsequently, the decision to engage in either risk-promoting or risk-reducing sexual behaviors.

### *Predictors and Correlates of Adolescent Sexual Behavior*

Given the psychosocial and health risks associated with early and unsafe sexual activity, a considerable amount of empirical research has focused on identifying predictors and correlates of adolescent sexual behavior (see Brooks-Gunn & Paikoff, 1991; Cooper, & Guthrie, 2007; Flick, 1986; Hayes, 1987; Kirby, 2002; Kotchick, Shaffer, Miller, & Forehand, 2001; Luster & Small, 1994; Small & Luster, 1994; Zimmer-Gembeck & Helfand, 2008, for reviews). Overall, these findings implicate a number of biological (e.g., hormones, early pubertal maturation) and social factors (e.g., peer acceptance, quality of relationship with parents) that may contribute to adolescents' decisions to become sexually active and, subsequently, the decision to engage in either risk-promoting or risk-reducing sexual behaviors. For example, research on biological factors that contribute to adolescent sexual behavior suggests that adolescents who mature earlier than their peers are more likely to have first intercourse early than adolescents who mature relatively on-time or late (e.g., Capaldi, Crosby, & Stoolmiller, 1996; Crockett, Bingham, Chopak, & Vicary, 1996; Flannery, Rowe, & Gulley, 1993; French & Dishion, 2003; Halpern, Udry, & Suchindran, 1997; Miller, Norton, Fan, & Christopherson, 1998; Waller & Dubois, 2004; Whitbeck, Yoder, Hoyt, & Conger, 1999).



French and Dubois (2003) examined the relations between family characteristics (i.e., parental monitoring, relationship quality, coercive parenting, and family structure), externalizing behaviors, problem behavior, pubertal status, and deviant-peer involvement to subsequent initiation of sexual intercourse among high-risk, virgin adolescents, ages 11 through 14 years ( $N = 162$ ). Results indicated that early pubertal maturation, externalizing behaviors, delinquency, substance use, low parental monitoring, and deviant-peer involvement were predictors of age of first sexual intercourse. Fifty-five percent of the adolescent boys and 47% of the adolescent girls engaged in intercourse by age 14 years.

Research on social factors that contribute to adolescent sexual behavior suggests that two-parent households, positive parental relationships, and open family communication about sex are associated with adolescent risk-reducing sexual behaviors (e.g., Aronowitz, Rennes, & Todd, 2005; Dittus & Jaccard, 2000; Jaccard, Dittus, Litardo, 1999; Moore & Chase-Lansdale, 2001; Newcomer & Udry, 1987). Conversely, adolescents are more likely to engage in health-compromising sexual behaviors if they perceive that their friends are supportive of these behaviors, if their peers are having sex, and if they have older siblings who model more sexually advanced behavior (e.g., East, Felice, & Morgan, 1993; LaGreca, Bearman, & Moore, 2000; Romer et al., 1994; Santelli, Kaiser, Hirsch, Radosh, Simkin, & Middlestadt, 2004; Smith, Flay, Bell, & Weissberg, 2001).

Dittus and Jaccard (2000) examined the relations between adolescents' perceptions of maternal abstinence attitudes, adolescent–maternal relationship satisfaction, and the occurrence of: (a) sexual intercourse, (b) the use of birth control

at intercourse, and (c) the occurrence of pregnancy in a sample of adolescents in grades 7 to 11 ( $N = 10,000$ ). Results relevant to the current study demonstrated that satisfaction with the mother-adolescent relationship longitudinally predicted adolescent sexual activity and use of contraceptives. Relationship satisfaction was also predictive of pregnancy occurrence. Thus, the more satisfied adolescents were with their relationship with their mothers, the less likely adolescents were to initiate sexual activity or become pregnant.

Taken together, adolescent sexual behavior depends on biological and social factors that correlate with other multiple developmental tasks of adolescence such as maintaining a quality relationship with parents, developing friendships outside the family, establishing romantic relationships, and developing the capacity for intimate relationships. These dyad relations influence adolescents' decisions to become sexually active and, subsequently, the decision to engage in either risk-promoting or risk-reducing sexual behaviors.

*Adolescent Sexual Behavior: A Couple-Based Perspective and Multiple Systems Approach*

Although substantial progress has been made in understanding the antecedents and consequences of early and unsafe sexual activity in adolescents, significant gaps in the literature remain (e.g. Aronowitz et al., 2005; Brooks-Gunn & Furstenberg, 1989; Jaccard et al., 1999; LaGreca et al., 2000; Moore & Chase-Lansdale, 2001; Newcomer & Udry, 1987; Romer et al., 1994; Smith et al., 2001). Most research on adolescent sexual behavior has been conducted with individual adolescents,

particularly adolescent girls, even though sexual behavior is the result of actions of a dyad (e.g., a male and female engaging in protected or unprotected sex) (e.g., Billy, Brewster, & Grady, 1994; East, 1996; Gibbons, Gerrard, & Boney-McCoy, 1995; Johnson & Green, 1993; Lock & Vincent, 1995). That is, for any given couple based behavior (e.g., the behavior of having sexual intercourse, the behavior of using condoms at a given instance of sexual intercourse), the male member has a certain set of cognitions, emotions, and characteristics linked to the behavior in question, as does the female member of the couple. The couple's behavior is some function of the meshing of these two sets of variables, one set from the male and one set from the female (Agnew, 1999). Little research has studied both members of the adolescent couple and then used measures from each couple member to predict and understand the sexual activity of that couple (see Udry & Chantala, 2004, for an exception).

Udry and Chantala (2004) examined the relation between couple sexual behavior, patterns of masculinity and femininity, and selection of romantic partners in a nationally representative sample of 983 adolescents (grades 7-12) who identified opposite-sex romantic partners within their school; 865 unique adolescent couples were identified. Results demonstrated that adolescent couples' with a very masculine boy and very feminine girl were more likely to have sex, and have sex the earliest. Adolescent couples' in which both members were in the average masculinity-femininity range for their sex were the quickest to break up. The authors concluded that the extent to which each couple member is masculine or feminine has a strong influence on the sexual behavior of adolescent romantic couples. Udry and Chantala (2004) did not include sexual risk behavior, however.

Despite the fact that romantic relationships are the context in which the majority of adolescents' sexual behavior occurs (Manning, Longmore, & Giordano, 2000), adolescent romantic relationships have rarely been the focus of investigations of adolescent sexual behavior (Bouchey & Furman 2003; Crockett, Raffaelli, & Moilanen, 2003). As a result, the relational contexts in which adolescents' decide to become sexually active and subsequently engage in risky sexual behavior is poorly understood. Further, relatively little work has been completed to link research on puberty and adolescent adjustment problems with the study of romantic involvement during adolescence (Brown et al., 1999; Compain & Hayward, 2003). Early pubertal maturation and more advanced levels of pubertal maturation have been linked to early romantic involvement among both adolescent boys and girls (see Compain & Hayward, 2003). Given that pubertal processes are directly related to physical and psychological sexual maturity (Brooks-Gunn & Reiter, 1990), the current study sought to understand the nature of these changes in relation to romantic involvement and how these interactions inform the risky sexual behavior of adolescent couples.

### *The Current Study*

The current study focused on the interplay of four systems of variables believed to be primary contributors to risky sexual behavior in adolescents; namely factors from (1) the self-system, (2) the biological system/context, (3) the peer context, and (4) the family context (see Figure 1). Assessments of these variables were made by each couple member separately and then these variables were used to predict the sexual activity of the couple. Specifically, this dissertation demonstrated that both male and female couple members' depressive symptoms, actual pubertal

development, perceived pubertal timing relative to one's peers, and maternal relationship satisfaction contribute to both risk promoting and risk reducing couple sexual behavior. Couple sexual behavior was assessed using the (1) occurrence of sexual intercourse, (2) frequency of sexual intercourse, and (3) consistent use of birth control at intercourse.

### *Study Questions and Hypotheses*

1. What is the relation between both male and female couple members' actual pubertal development and perceived pubertal development?

*Hypothesis 1:* Both male and female couple members who report more advanced levels of pubertal development will perceive their pubertal development to be earlier than their peers.

2. What is the relation between both male and female couple members' actual and perceived pubertal development and couple sexual risk behavior?

*Hypothesis 2:* Both male and female couple members who report more advanced levels of pubertal maturation will show a significant positive association with couple sexual risk behavior.

*Hypothesis 3:* Both male and female couple members who perceive their pubertal development to be earlier than their peers will show a significant positive association with couple sexual risk behavior.

3. What is the relation between both male and female couple members' actual and perceived pubertal timing and each respective member's depressive symptoms?

*Hypothesis 4:* Female couple members who report more advanced levels of pubertal maturation will show a significant positive association with the female couple member's depressive symptoms and Male couple members who report more advanced levels of pubertal maturation will show a significant negative association with the male couple member's depressive symptoms.

*Hypothesis 5:* Female couple members who perceive their pubertal development to be earlier than their peers will show a significant positive association with the female couple member's depressive symptoms and Male couple members who perceive their pubertal development to be earlier than their peers will show a significant negative association with the male couple member's depressive symptoms.

4. What is the mediating role of male and female couple member's depressive symptoms on the links between each respective member's actual and perceived pubertal timing and couple sexual risk behavior?

*Hypothesis 6:* Male and female couple member's depressive symptoms will partially mediate the links between each respective member's actual and perceived pubertal timing and couple sexual risk behavior.

5. What is the relation between both male and female couple members' relationship satisfaction with their mothers and couple sexual risk behavior?

*Hypothesis 7:* Both male and female couple members who are more satisfied with their relationship with their mothers will show a significant negative association with couple sexual risk behavior.

6. What is the relation between both male and female couple members' relationship satisfaction with their mothers and each respective member's depressive symptoms?

*Hypothesis 8:* Both male and female couple members who are more satisfied with their relationship with their mothers will show a significant negative association with each respective member's depressive symptoms.

7. What is the mediating role of both male and female couple member's depressive symptoms on the links between each respective member's maternal relationship satisfaction and couple sexual risk behavior?

*Hypothesis 9:* Both male and female couple member's depressive symptoms will partially mediate the links between each respective member's maternal relationship satisfaction and couple sexual risk behavior.

### *Theoretical Perspective*

Researchers have drawn from a number of theoretical perspectives to better understand adolescent sexual behavior (Hirschi, 1969; Jessor & Jessor, 1977; Jessor, van den Bos, Vanderryn, Costa, & Turbin, 1995; Rodgers & Rowe, 1993; Smith, Udry, & Morris, 1985; Udry, 1988). The multiple systems approach adopted in the current study was guided, in part, by Bronfenbrenner's ecological systems theory. Bronfenbrenner's theory emphasizes the reciprocal relations among multiple systems of influence on a person's behavior (Bronfenbrenner, 1977, 1979). Bronfenbrenner's ecological systems theory also suggests that the multiple systems of influence on a person's behavior exist at multiple levels of the person's life or social ecology. Based on Bronfenbrenner's theory, an accurate and comprehensive understanding of the sexual behavior of adolescent romantic couples should include some knowledge of both the personal and the environmental factors that contribute to each couple member's decision to become sexually active. The personal and the environmental factors that contribute to each couple member's decision to become sexually active also influences the decision to engage in either risk-promoting or risk-reducing sexual behaviors.

Bronfenbrenner's theory further acknowledges that higher order systems, such as race, ethnicity, or social economic status may also exert influence on the sexual behavior of adolescent romantic couples. The current study assumed that the influences of these higher order systems permeate through the factors noted above (i.e., adolescent depressive symptoms, pubertal timing, perceived pubertal timing relative to one's peers, and adolescent-maternal relationship satisfaction) to influence



the sexual behavior of adolescent romantic couples'. Thus, race, ethnicity, and social economic status were used as covariates in the study models.

The current study demonstrated that the relations among the factors noted above (i.e., depressive symptoms, pubertal timing, perceived pubertal timing relative to one's peers, and adolescent-maternal relationship satisfaction) are transactional and interactional, with each factor exerting both direct and indirect effects on couple sexual behavior. These variables interact with each other, such that risks from one serve to either potentiate or buffer against the effects of others, and that each variable influences other factors as well as couple sexual behavior itself. In this sense, one factor serves as either a partial or full mediator of the effects of other factors on couple sexual behavior.

#### *Four Models of Couple Influence*

The current study examined four hypothesized relational models believed to capture the ways in which gender may influence the attributes of each couple member (i.e., depressive symptoms, adolescent-maternal relationship satisfaction, pubertal timing, and perceived pubertal timing relative to one's peers) and, in turn, subsequent couple sexual activity. Consider, as an example, pubertal development. The first model, termed the *female influence model*, states that the level of pubertal development impacts the sexual behavior of a couple, but that the primary influence on such behavior is the level of pubertal development on the part of the female member of the dyad as opposed to the male member of the dyad. That is, pubertal status of the male does not impact the couple behavior, but female pubertal status

does. The second model, termed the *male influence model*, occurs when male pubertal status rather than female pubertal status influence the couple's sexual activity. The third model, termed the *shared influence model*, conceptualizes the pubertal status of both the male and female partner as being independent determinants of couple based sexual risk behavior.

The final model involves more complex couple dynamics and is termed the *configural influence model*. This model is a variant of the shared influence model in that it accounts for risky sexual couple behavior using the pubertal development variables of both partners, but it allows for configural influence. In addition to the independent effects of the pubertal status of both couple members, the interactional influence model posits an interaction effect between couple member pubertal status such that as female pubertal development advances, male pubertal development become more strongly related to risky sexual behavior.

The four relational models were tested for all of the study variables described above (i.e., depressive symptoms, pubertal development, perceived pubertal development relative to one's peers, and maternal relationship satisfaction). Thus, the current study demonstrated which study variables (i.e., depressive symptoms, pubertal development, perceived pubertal development relative to one's peers, and adolescent - maternal relationship satisfaction) for which couple member (i.e., male member, female member) were most influential in shaping couple sexual activity.

The following section of this dissertation is the literature review. In the literature review, background information on adolescent romantic relationships is

summarized, followed by a discussion of the variables relevant to the present dissertation, namely, adolescent depressive symptoms, pubertal development, perceived pubertal timing relative to one's peers, and adolescent-maternal relationship satisfaction. The literature review concludes with a summary of the proposed study model.

## CHAPTER II

### LITERATURE REVIEW

#### *Background Information on Adolescent Romantic Relationships*

It is no surprise that one of the strongest predictors of adolescent sexual behavior is whether an adolescent is involved in a romantic relationship (e.g., Blum, Beuhring, & Rhinehart, 2000; Furman & Wehner, 1997; Hatfield & Rapson, 1987). Establishing a romantic relationship is a key developmental task of middle and late adolescence and provides a context for dating and sexual behavior (Collins & Sroufe, 1999; Sprecher, Barbee, & Schwartz, 1995). Adolescent romantic involvement and frequency of romantic experiences occurs on a continuum. Adolescents typically progress from involvement in same-sex peer group activities in early adolescence to affiliation with mixed-sex groups in early to middle adolescence and then to dyadic romantic relationships in middle to late adolescence (e.g., Connolly et al., 2004; Dunphy, 1963; Kovacs, Parker, & Hoffman, 1996). Many adolescents who become romantically involved spend increasingly more of their time with their romantic partners than with their parents, siblings, or friends (Laursen & Williams 1997; Richards, Crowe, Larson, & Swarr, 1998).

More than half (55%) of the adolescents in the United States aged 12 to -18 years have experienced a romantic relationship (Carver, Joyner, & Udry, 2003). Adolescent romantic relationship prevalence appears to be equal for boys and girls (64% and 65%, respectively). However, prevalence is slightly higher for girls who are 15 years and older as compared to similarly aged boys (Carver et al, 2003).

Although experiencing a romantic relationship is more likely among older adolescents, significant proportions of young adolescents also report experiencing a romantic relationship. Carver et al. (2003) indicated that about 25% of 12-year-olds, 36% of 13-year-olds, 53% of 15-year-olds, and 70% of 17-year-olds report having had a romantic relationship. Thus, by middle adolescence, most adolescents have been involved in at least one romantic relationship.

Part research using data from the National Longitudinal Study of Adolescent Health (Add Health; Bearman, Jones, & Udry, 1997; Udry, 1997) has shown that a little more than half of all adolescent romantic relationships that occur within the school are not reciprocally acknowledged by the other partner (Carver & Udry, 1997). Carver and Udry (1997) found that older adolescents nominating individuals as their romantic partners were more likely than younger adolescents to have their romantic nomination acknowledged. Further, both males and females were more likely to reciprocate nominations when both were sexually experienced and less likely when only the member of the opposite sex was experienced. Physical attractiveness in females but not in males increased the likelihood that a nomination would be reciprocated. Lastly, high weight for height did not interfere with reciprocity nor did degree of physical development (Carver & Udry, 1997).

The implications of Carver and Udry (1997) on adolescents' decision to become sexually active, and subsequently, the decision to engage in either risk-promoting or risk-reducing sexual behavior are unclear. It is possible that adolescents who are in reciprocated romantic relationships are engaging in more risk-reducing behaviors; whereas adolescents who are in non-reciprocated romantic relationships

are engaging in more risk-promoting behaviors. Adolescent romantic experiences are complex. There are a number of dimensions of adolescent romantic experiences other than actual romantic relationships such as fantasies and one-sided attractions (“crushes”). In addition, adolescent romantic experiences may involve interactions with potential romantic partners and brief nonromantic sexual encounters (e.g., “hooking up,” or casual involvement in activities usually thought to take place with romantic partners, from “making out” to sexual intercourse) (Brown et al., 1999; Manning et al., 2006).

Despite the complexity of adolescent romantic experiences, little research has examined the various dimensions of adolescent romantic experiences beyond actual relationships (Collins, 2003; Collins, Welsh, & Furman, 2009). As such, the current study examines adolescent sexual behavior in the context of reciprocated and non-reciprocated adolescent romantic relationships. In addition, the current study examines several dimensions of adolescent romantic experiences such as romantic involvement, partner selection, relationship content, and relationship quality (Collins, 2003). Romantic involvement refers to whether or not a person dates, when s/he began dating, the duration of the relationship, and the frequency and consistency of dating and relationships. Partner selection is concerned with the characteristics of the person with whom an adolescent has a romantic experience. Relationship content attempts to capture what the members of the dyad do and do not do together and relationship quality pertains to the relative degree of positive, supportive, beneficent experiences as compared to the negative, potentially detrimental ones such as abusive behaviors.

### *The Self-System: Adolescent Depressive Symptoms*

One of the most consistent findings in developmental research is that adolescent girls are significantly more likely than adolescent boys to experience depressive symptoms (e.g., Compas et al., 1997; Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Nolen-Hoeksema & Hilt, 2002; Wichstrom, 1999). Specifically, by late adolescence, girls are twice as likely as boys to score significantly higher on continuous measures of depressive symptoms (e.g., Cole et al., 2002; Cyranowski, Frank, Young, & Shear, 2000; Galambos, Leadbeater, & Barker, 2004; Hankin & Abela, 2005; Hankin, Abramson, Moffitt, Silva, McGee, & Angell, 1998; Twenge & Nolen-Hoeksema, 2002).

Hankin, Mermelstein, and Roesch (2007) examined relations between adolescents' depressive symptoms, alcohol use, and occurrence of stressors in a community sample of adolescents ( $N = 538$ ; 54.5% female; ages 13–18 years, average 14.9 years). Findings relevant to the present dissertation demonstrated that girls reported more depressive symptoms and stressors in certain contexts (e.g., interpersonal) than boys. In addition, sex differences in depression were partially explained by girls reporting more stressors, especially events involving peers. The longitudinal direction of effects between depression and stressors varied depending on the stressor domain. Girls reacted more strongly to stressors than boys in the form of depression.

Theorists have posited conceptual models to explain why more girls than boys become depressed during adolescence (e.g., Cyranowski et al., 2000; Hankin &

Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Rudolph, Hammen, Burge, Lindberg, Herzberg, & Daley, 2002). A common theme among these conceptual models is the increasingly stronger influence that negative life events, especially those in interpersonal contexts (e.g., peer, romantic, and family relationships), may have on psychosocial adjustment. For example, Hankin and Abramson (2001) presented a cognitive vulnerability-stress model of depression in which preexisting vulnerabilities (resulting from genetics, personality, and environmental adversity) contribute to cognitive vulnerabilities (rumination and negative instrumental style) and the likelihood of experiencing negative life events. The model posited that negative life events contribute to initial levels of general negative affect (anxious, depressive, and angry affect). Increases in negative affect can then lead to increases in depressive symptoms. The combination of negative affect and depressive symptoms, in turn, leads to more negative life events, which create a cycle of repetition of depressive experiences.

Adolescent romantic relationships may play a role in these conceptual models of adolescent depression (e.g., Cyranowski et al., 2000; Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Rudolph et al., 2002) because these relationships may provide the contexts in which cognitive vulnerabilities are likely to manifest and be maintained. In light of the above, the current study examined the role of depression within the context of adolescent romantic relationships and the ways in which depression may impact couple sexual risk behavior.



*Associations between Adolescent Romantic Involvement, Adolescent Risky Sexual Behavior, and Adolescent Depressive Symptoms.* Past research identified adolescent romantic involvement as an important correlate of depressive symptoms (e.g., Davila et al., 2004; Joyner & Udry, 2000; Larson et al., 1999; Monroe et al., 1999). Overall, findings from these studies reveal that adolescents involved in a romantic relationship and/or are steady or frequent daters report more depressive symptoms than adolescents not romantically involved and/or are not steady or frequent daters. For example, using a nationally representative longitudinal sample of adolescents (ages 12-17 years;  $N = 8181$ ), Joyner and Udry (2000) demonstrated that adolescents who became involved in a romantic relationship during the year between data collection points reported more depressive symptoms than their counterparts who were not romantically involved during the year. Although romantic involvement was significantly linked to depressive symptoms among both adolescent girls and boys, girls showed larger increases than boys in their depressive symptoms between the assessment points in response to romantic involvement.

The finding that girls involved in romantic relationships are more vulnerable to depression than boys involved in romantic relationships is probably not coincidental given that adolescent girls, compared to adolescent boys, report greater interests in establishing romantic relationships (Darling et al., 1999) and are more preoccupied with romantic relationships (Larson et al., 1999). In a series of beeper studies in which adolescents were beeped at random times during the day to understand their daily experiences, Larson and his colleagues found that adolescents were more likely to attribute strong emotions such as depression to romantic

relationships than to school or family concerns (Larson et al., 1999). Girls attributed 34% of their strong emotions to real and fantasized romantic relationships; boys attributed 25% of their strong emotions to real and fantasized romantic relationships. In sum, past research provides strong empirical evidence that adolescent romantic involvement is stressful and is related to symptoms of depression in adolescents, particularly adolescent girls.

Research findings also have shown links between adolescent depressive symptoms and risky sexual behavior (e.g., Brooks, Harris, Thrall, & Woods, 2002; Kowaleski-Jones & Mott, 1998; Lehrer, Shrier, Gortmaker, & Buka, 2006; Shrier, Harris, Sternberg, & Beardslee, 2001; Wingood & DiClemente, 1998). Overall, findings from these studies reveal that adolescent depressive symptoms are significantly associated with condom nonuse, sexually transmitted diseases (STDs) such as herpes and syphilis, and unintended pregnancy. Using a nationally representative longitudinal sample of adolescents ( $N = 6583$ ; ages 12-17 years), for example, Shrier et al. (2001) showed that depressive symptoms were associated with an increased risk for not using a condom at last intercourse for boys, whereas depressive symptoms were associated with a history of STDs but not with condom nonuse for girls.

Similarly, Lehrer et al. (2006) found that adolescents with high levels of depressive symptoms were significantly more likely than adolescents with low levels of depressive symptoms to report risky sexual behavior during the year between data collection points. Specifically, high levels of depressive symptoms were predictive of substance use at last sexual intercourse and birth control and condom nonuse at last

sexual intercourse for boys; moderate levels of depressive symptoms were associated with substance use at last sexual intercourse for girls. No significant associations were found between high levels of depressive symptoms and individual sexual risk behaviors for adolescent girls. These studies provide overall strong empirical evidence that adolescent depressive symptoms are related to risky sexual behavior and that this relation may vary by gender.

*Summary* . Although adolescent romantic involvement and sexual risk-taking behaviors are linked to adolescent depressive symptoms, the processes through which depression is linked to risky sexual behaviors and adolescent romantic involvement are not well understood. Importantly, this body of literature has failed to consider couple dynamics in the ways that depression may impact sexual activity. In this dissertation, both male and female couple members' depressive symptoms were assessed and then each respective member's depressive symptoms were used as independent predictors of the sexual activity of the couple. As noted earlier, four hypothesized models representing couple dynamics with respect to depression were specified: (1) the female influence model, (2) the male influence model, (3) the shared influence model, and (4) the configural influence model. The four hypothesized couple-dynamics suggest potential pathways through which gender may influence adolescent psychosocial adjustment and, in turn, subsequent couple sexual activity.

*The Female Influence Model*. The female influence model states that the depression level of the female member of the dyad rather than the male member of the dyad will be the primary influence of the sexual activity of the couple. This

model is based on the notion that the consequences of an unintended pregnancy are more far reaching for females as opposed to males. As a result, the females may be the primary “gate-keeper” with respect to sexual activity, thereby suggesting that the depression levels of the female will be the key predictor of sexual activity on the part of the couple.

*The Male Influence Model.* The male influence model states that the depression level of the male member of the dyad rather than the female member of the dyad is the primary influence of the sexual activity of the couple. This model draws partly on gender roles as they relate to intimacy and dating behavior, which posit that males as opposed to females tend to be the partner who initiates sexual behavior in heterosexual couples (Gagnon & Simon, 1987; McCormick, 1987; LaPlante, McCormick, & Brannigan, 1980). As a result, one might expect the depression levels of the male to be most important in impacting couple sexual activity.

*The Shared Influence Model.* The shared influence model conceptualizes the depression of both the male and female partner as being independent predictors of couple sexual risk behaviors. This model draws on both types of theorizing used in the female and male influence models and integrates them such that the depression of both partners may influence couple sexual activity.

*The Configural Influence Model.* The configural influence model involves more complex couple dynamics. This model is a variant of the shared influence model in that it accounts for couple risky sexual behaviors using the depression levels

of both partners but allows for the potential of configural influence. In addition to the independent effects of the depression of both couple members,' the configural influence model posits an interaction between each respective member's depression levels such that as female depression increases, male depression becomes more strongly related to couple risky sexual behavior. The converse is also plausible; that is, as male depression increases, female depression becomes more strongly related to couple risky sexual behavior.

*The Biological System/Context: Pubertal Development*

Pubertal maturation is the single most salient developmental change occurring during adolescence, transforming the body from a child-like appearance to an adult (Alsaker, 1996; Graber, Petersen, & Brooks-Gunn, 1996; Hayward, 2003). The hormonal and physical changes associated with puberty are different for boys and girls. For example, on average girls experience a greater and faster increase in body fat than boys; whereas boys experience a greater and faster increase in muscular growth (Rogol, Clark, & Roemmich, 2000). As a result, girls tend to reach the lean muscle mass of a young woman by about 15-16 years of age; whereas boys reach the lean muscle mass of a young man at about 19-20 years of age (Rogol et al., 2000).

The hormonal and physical changes associated with puberty occur within a social context that confers values upon this process (Graber, Petersen, & Brooks-Gunn, 1996). As a result, the ease or difficulty of accommodating to these changes and to the variation in their timing has important implications for the psychosocial adjustment of adolescents. Accommodating to pubertal changes appears to be

particularly difficult for early-maturing girls. Girls who experience puberty early display more problem behaviors and signs of emotional distress than their same sex peers who experience puberty either on-time or late (e.g., Caspi & Moffitt, 1991; Ge, Conger, & Elder, 1996, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997). Early maturation in boys generally has been found to result in more positive consequences for psychosocial adjustment. Some studies have also found early maturation to be problematic in boys, however (e.g., Ge et al., 1996, 2001).

In addition, early-maturing girls and boys tend to socialize with older peers, engage in norm-breaking activities, entertain earlier romantic and sexual experiences, and experience more conflicts with their parents (Caspi & Moffitt, 1991; Ge et al., 1996, 2001; Graber et al., 1997; Weichold & Silbereisen, 2001). Thus, early pubertal timing appears to have some influence on psychosocial adjustment in adolescence, with those who mature earlier experiencing the most difficulties.

Developmental research suggests that adolescents who appear more physically mature than others may prompt responses from their social environment that include opportunities for romantic and sexual behavior (Graber et al., 1998; Phinney et al., 1990). Romantic relationships constitute an important, but understudied, developmental context for accommodation to pubertal change, however (Compain & Hayward, 2003). These relationships may provide an adolescent with feedback about his or her appearance, and thereby influence an adolescent's judgments about his or her attractiveness (Feiring, 1999). Because the presence of a romantic partner, and characteristics of the interpersonal dynamics with that partner may serve an important

role in pubertal accommodation, this dissertation examined the ways in which puberty influences couple sexual activity.

*Associations between Adolescent Romantic Involvement, Adolescent Risky Sexual Behavior, and Pubertal Development.* Early pubertal maturation and more advanced levels of pubertal maturation have been linked to early romantic involvement and early sexual debuts for both adolescent boys and girls (e.g., Capaldi et al., 1996; Flannery et al., 1993; Halpern, Kaestle, & Hallfors, 2007; Halpern et al., 1997; Mezzich, Tarter, Giancola, Lu, Kirisci, & Parks, 1997; Phinney et al., 1990; Smith, Udry, & Morris, 1985; Zimmer-Gembeck & Collins, 2008). Phinney et al. (1990), for example, examined the relation between early sexual maturation and the psychosexual behaviors of dating and sexual intercourse using a national sample of adolescent females aged 15 to 19 years ( $N = 1,834$ ). Results relevant to the present dissertation demonstrated that early-maturing girls were more likely to have experienced earlier dating and coital onset than were their later-maturing peers. Black adolescent girls experienced menarche and first intercourse at earlier ages than non-Black adolescent females. In addition, Black adolescent girls experienced dating onset at a later age than non-Black adolescent females.

In a more recent study, Zimmer-Gembeck and Collins (2007) examined whether biological and social factors determined growth in sexual partnering from ages 16–26 years in a sample of 176 youths (47% female) followed from birth to age 26 years. Sexual partnering was measured as the accumulated number of different sexual intercourse partners at ages 16, 19, 23, and 26 years. Physical appearance of maturity, alcohol use, and dating were measured at ages 13–16 years via

observations, interviews, and questionnaires. Results demonstrated that mature appearance at age 13 years, use of alcohol more than monthly at age 16 years, and a history of a steady romantic partner before age 16 years were each associated with a greater number of sexual intercourse partners by age 16 years. However a more mature appearance, more frequent alcohol use, and greater dating involvement did not foreshadow a steeper accumulation of sexual partners between ages 16 and 26 years. Only gender had such a “growth” influence, with males accruing sexual partners more rapidly from the ages of 16–26 years when compared with females.

Thus, adolescents had accumulated a higher number of sexual partners by age 16 years when they looked older, drank alcohol more frequently, and were more involved with dating in early to middle adolescence. Also male gender was associated with accumulation of sexual partners more rapidly between ages 16 and 26 years, and there was little indication that the accumulation of different sexual partners had begun to slow by age 26 years for the average participant.

Despite significant links between early pubertal maturation, early romantic involvement, and early sexual debut, only one study (Mezzich et al., 1997) has examined the effects of early pubertal timing (i.e., age at menarche) on risky sexual behavior. Using a sample of adolescent girls ages 14-18 years ( $N = 203$ ), Mezzich et al. (1997) demonstrated that age at menarche was significantly correlated with affiliation with an older boyfriend and risky sexual behavior (i.e., sex without condom, multiple partners, and sexual intercourse with a person who self-injects drugs). The authors concluded that early menarche may be a risk factor for affiliation with an adult boyfriend, which in turn may lead to risky sexual behavior.



One possible explanation of the above findings is the classic stage termination theory (Peskin & Livson, 1972; Petersen & Taylor, 1980). According to this theory, early pubertal timing puts girls at risk for behavioral and emotional problems because it interrupts the regular course of development. As a result, early developing girls have less time and are less prepared to confront the new challenges of adolescence such as moving into older mixed sex peer groups and entering romantic relationships (Peskin & Livson, 1972; Petersen & Taylor, 1980).

The readily observable physical changes that occur during puberty may further compound early developing girls' difficulties because others (e.g., peers, family) may view the girls as older and more socially and cognitively advanced than the girls actually are (Brooks-Gunn, Petersen, & Eichorn, 1985, Caspi, 1995, Caspi & Moffitt, 1991). Thus, early developing girls may be less prepared socially and cognitively for the biological and psychosocial changes and expectations that likely occur in their families and peer networks around the time of puberty (Paikoff, Brooks-Gunn, & Warren, 1991). This may result in a higher incidence of depression in girls and, to the extent that female depression levels impact couple sexual activity, may result in higher incidences of risky sexual activity.

*Summary*. The current study advances research on early pubertal timing and risky sexual behavior in two important ways. First, it extends past research that has been individually focused to a couple-dynamic focus. Second, by assessing pubertal timing for both male and female romantic partners independently, it tests the four hypothesized couple-dynamic models described earlier (the female influence model, the male influence model, the shared influence model, and the configural influence

model), but using puberty in place of depression. Lastly, it tests for the mediating effects of depression in the context of the four hypothesized couple-dynamic models.

### *The Peer Context: Perceived Pubertal Development*

The current study focuses on one facet of the peer context that is directly tied to pubertal timing: perceived pubertal timing. Perceived pubertal timing, whether an adolescent believes they are early, late, or on-time compared to their peers, affords the opportunity to index a more psychologically textured aspect of pubertal timing (Graber et al., 1997). That is, perceiving oneself to be experiencing pubertal changes in temporal isolation from one's peer group may be partly based on how well the adolescent's pubertal timing aligns with the ideals of their socio-cultural context. If adult features are valued, late maturation may confer risk; whereas if child-like features are valued, early maturation may confer risk (Brooks-Gunn et al., 1985).

Hence, perceived pubertal timing may reflect a different process than direct inquiry regarding the onset of puberty (e.g., age at menarche), possibly at the individual or social rather than biological level, yielding new and important information (Graber et al., 1996). Only a handful of studies have examined adolescents' perceptions of pubertal timing. Studies that have done so suggest more psychological and social difficulties among adolescents who perceive themselves to be either early or late in their development compared to adolescents who perceive themselves to be on-time (Graber et al., 1997; Michael & Eccles, 2003; Siegel, Yancey, Aneshensel, & Schuler, 1999; Silbereisen, Petersen, Albrecht, & Kracke, 1989; Wilen, & Petersen, 1980). Siegel et al. (1999), for example, found girls who

perceived their pubertal timing as early relative to their peers reported significantly more symptoms of depressed mood than girls who perceived their pubertal timing as on-time. Late developers were not significantly different from either early or on-time developers. If perceived pubertal timing relative to one's peer group is linked to depression and if depression, in turn, is linked to sexual activity, then perceived pubertal timing may predict risky sexual behavior independent of other assessments of puberty such as age of menarche.

The most widely accepted explanation for the effect of perceived pubertal timing relative to peers on emotional problems is the social deviance hypothesis (Alsaker, 1992; 1996). According to the social deviance hypothesis, any deviation from the norm in relation to one's peer group (early or late) heightens the risk for behavioral and emotional problems due to perceived lack of shared experiences with ones peer group and the feeling of being different from peers (Neugarten, 1969, 1979). Thus, adolescents who perceive themselves as developing early and/or late relative to their peers may see themselves differently and may, as a result, behave differently. The social deviance hypothesis stands in contrast to the stage-termination hypothesis (Peskin & Livson, 1972, Petersen & Taylor, 1980), which predicts difficulties for only early developers.

Research linking peer context to adolescent romantic involvement and risky sexual behavior are partly based on pubertal maturation. Early maturing adolescent girls and boys tend to socialize with older peers and affiliate with peers who engage in norm-breaking activities, which in turn, may increase opportunities for sexual behavior (e.g., Chen, Stiffman, Cheng, & Dore, 1997; La Greca, Prinstein, & Fetter,

2001; Magnusson, Stattin, & Allen, 1985; Prinstein, Meade, & Cohen, 2003; Stattin & Magnusson, 1990; Weichold & Silbereisen, 2001; Whitaker & Miller, 2000; Whitbeck et al., 1999). Whitaker and Millier (2000) examined how parent-adolescent communication about initiating sex and condoms influenced the relationship between peer norms and behavior in a sample of adolescents aged 14-16 years ( $N = 907$ ). Results demonstrated that communication about sex and perceived peer norms about sex were each related to sexual behavior, and communication about condoms and peer norms about condoms were related to condom use behavior. For both sex and condom use, the peer norm-behavior relationship was moderated by parental communication: Peer norms were more strongly related to behavior among adolescents who had not discussed sex or condoms with a parent. Communication was also related to adolescents' naming a parent as their best source of information about sex. Results suggested that a lack of communication may cause adolescents to turn to peers and that peers may then influence their behavior.

*Summary.* The current study focuses on both actual pubertal timing and perceived relative pubertal timing. The study is unique in exploring the joint contribution of these variables in conjunction with depression. The study advanced research on perceived relative pubertal timing in three ways. First, it extends research paradigms that have been individually focused to a couple-dynamic focus. Second, by assessing perceived relative pubertal timing for both male and female partners independently, it tests the four hypothesized couple-dynamic models described earlier (the female influence model, the male influence model, the shared influence model, and the configural influence model), but using perceived relative pubertal timing

measures in place of the depression variables. Third, it tests for the mediating effects of depression in the context of the hypothesized couple-dynamic models. Fourth, it examines the contributions of perceived relative pubertal timing independent of actual pubertal timing in the context of the four hypothesized couple-dynamic models.

*The Familial Context: Adolescent-Maternal Relationship Satisfaction*

Considerable research has focused on the parent-adolescent relationship (e.g., Collins & Repinski, 1994; Holden & Miller, 1999; Holmbeck, 1996; Laursen, Coy, & Collins, 1998; Paikoff, Brooks-Gunn, & Warren, 1991; Steinberg, 2001; Steinberg & Silk, 2002) and how it contributes to adolescent development. Research on the parent-adolescent relationship has demonstrated that adolescents who are permitted to assert their own opinions within a family context that is secure and loving develop higher self-esteem and more mature coping skills; whereas adolescents for whom autonomy is inhibited are at risk of developing feelings of depression and problem behaviors (e.g., Allen, Hauser, Eickholt, Bell, & O'Connor, 1994; Rathunde, 1996; Steinberg, 2001; Silverberg, Tennenbaum, & Jacob, 1992). As a result, adolescents for whom autonomy is inhibited are more likely than their peer counterparts to feel dissatisfied with their relationships with their parents.

Researchers have investigated the impact of gender on parent-adolescent relationships, but the role of gender in these relationships is unclear (Holden & Miller, 1999). There are several reasons why gender might moderate changes in the parent-adolescent relationship during adolescence. There is some evidence that conflict between adolescents and parents, especially mothers, increases around the

onset of puberty (e.g., Laursen et al., 1998, Sagrestano, McCormick, Paikoff, & Holmbeck, 1999). Given girls, on average, undergo puberty earlier and are socially more advanced than boys (Brooks-Gunn & Reiter, 1990), perhaps changes in the parent– adolescent relationship may occur earlier in adolescence with girls than with boys. Several studies have also indicated that the quality of family relationships may affect the timing and course of puberty, with earlier and faster maturation observed among adolescents raised in homes characterized by less closeness and more conflict (Graber, Brooks-Gunn, & Warren, 1995, Kim & Smith, 1998) and among girls from homes in which their biological father is not present (Surbey, 1990).

Another reason why gender might moderate changes in the parent– adolescent relationship during adolescence is because of the increased risk for mental health problems during adolescence. Adolescent boys are at greater risk for externalizing problems, whereas adolescent girls are at greater risk for internalizing problems (Crick & Zahn-Waxler, 2003; Rutter, Caspi, & Moffitt, 2003). Thus, it is possible that the emergence of gender differences in rates of depression during adolescence might lead to the expectation that girls will show greater increases in parent– adolescent conflict than boys (Crick & Zahn-Waxler, 2003). Given that the family context is the most influential socializing agent for growth and development during adolescence, this dissertation examined the role of adolescent-maternal relationship satisfaction within the context of adolescent romantic relationships and the ways in which adolescent-maternal relationship satisfaction may impact adolescent sexual behavior.

*Significance of Adolescent-Maternal Relationship Satisfaction to*

*Understanding Adolescent Risky Sexual Behavior.* Research has demonstrated that the quality of an adolescent's relationship with his or her mother, including how the adolescent perceives this relationship, is significantly associated with risky sexual behavior (see Kotchick et al., 2001, for a review). Bull and Hogue (1998), for example, examined factors associated with repeat childbearing among adolescents using data gathered in focus groups with adolescent mothers and parents of adolescent mothers. Results demonstrated that poor mother-daughter relationships, conflicting support for the roles adolescent mothers are expected to assume, limited social pressures for effective fathering, and limited access to social services for all family members were associated with an increased likelihood of repeat teen pregnancy in low-income adolescent mothers.

There is also some evidence linking adolescent-maternal relationship satisfaction to adolescent depression (e.g., Reinherz, Paradis, Giaconia, Stashwick, & Fitzmaurice, 2003; Sheeber, Hops, & Davis, 2004; Sheeber, Hops, Alpert, Davis, & Andrews, 1997; Stice, Ragan, & Randall, 2004). Stice et al. (2004), for example, examined perceived social support (mothers and peers) and adolescent depression in a sample of adolescent girls aged 11-15 years ( $N = 496$ ). Results demonstrated that low perceived maternal support but not peer support predicted future increases in depressive symptoms and onset of major depression. In contrast, initial depressive symptoms and major depression predicted future decreases in peer support but not maternal support. Thus, low maternal support may increase risk for depression in adolescents. As a result, it is possible depression may serve as a partial mediator of

the effects of both male and female couple members' relationship satisfaction with their mothers on couple sexual activity.

Recent studies have identified possible mediating mechanisms that could help explain how adolescent-maternal relationships influence adolescents' sexual behavior. In one study, Scaramella, Conger, Simons, and Whitbeck (1998) demonstrated that the effects of parental warmth and involvement in 7th grade affected teen pregnancy status in 12th grade through intervening mechanisms such as deviant peer affiliations, substance use, delinquency, and academic competence. Results of other studies indicate that adolescent-maternal closeness is related to mediating mechanisms such as adolescents' attitudes about having intercourse, adolescents' depression, adolescents' impulse control, and adolescents' association with sexually active peers.

All of these studies focused on adolescent sexual behavior and pregnancy. The studies specifically suggested that a lack of closeness in the parent-adolescent relationship increases the negative influence of peers on adolescent sexual activity (Benda & DiBlasio, 1991; Feldman & Brown, 1993; Whitbeck, Conger, & Kao, 1993; Whitbeck, Hoyt, Miller, & Kao, 1992). Other studies however have found parent-adolescent closeness and involvement can reduce adolescent sexual behavior by enhancing adolescents' educational achievement and helping them acquire a sense of competence and worth (Ramirez-Valles, Zimmerman, & Newcomb, 1998).

Finally, several studies suggest that the quality of the parent-adolescent relationship predicts the quality of interactions between adolescents and their romantic partners (Conger, Cui, Bryantt, & Elder, 2000; Kim, Conger, Lorenz, &



Elder, 2001; Linder & Collins, 2005; Roisman, Madison, Hennighausen, Sroufe, & Collins, 2001). Roisman et al (2001), for example, examined the observationally assessed parent–adolescent (age 13 years) dyadic variables to the observationally assessed quality of these individuals’ romantic relationships in young adulthood (age 20 to 21 years). Results demonstrated that adolescents’ representations of their relationships with their parents at age 13 years were significantly associated with the later quality of their interactions with their romantic partners at ages 20 to 21 years. These findings suggest that salient parent–adolescent experiences are internalized and carried forward into romantic relationships during emerging adulthood.

*Summary.* Taken together, the above findings suggest that adolescent-maternal relationship satisfaction may be important for better understanding risk-promoting or risk-reducing sexual behaviors in adolescent romantic couples’. As such, the current study examines the ways in which adolescent-maternal relationship satisfaction is associated with sexual behaviors in adolescent romantic couples. Specifically, the current study extends research paradigms that have utilized individual-based analyses to a couple-dynamic focus. Second, it assesses adolescent reports of relationship satisfaction with their mothers for both male and female partners independently, and then tests the four hypothesized couple-dynamic models described earlier (the female influence model, the male influence model, the shared influence model, and the configural influence model), in the context of adolescent-maternal relationship satisfaction. Lastly, the current study explores the mediating effects of depression in the context of the four hypothesized couple-dynamic models.

*The Current Study: A Risk and Protective Model for Predicting Sexual Risk-Promoting and Risk-Reducing Behaviors in Adolescent Romantic Couples*

In sum, this dissertation integrates individual, familial, and social factors believed to be primary contributors to adolescent sexual risk behaviors into a conceptual model that simultaneously considers the influence and complexity of their combined effects on couple sexual risk behaviors. Although substantial progress has been made in understanding the antecedents and consequences of risky adolescent sexual behaviors, scant attention has focused on the relational contexts (family, peers, and romantic partners) of adolescent risky sexual behaviors, such as how adolescents negotiate aspects of their relationships as they make their sexual decisions. A unique feature of the current study is its examination of the impact of variables relating to individual, family, and social factors in the context of adolescent couples. The existing literature on adolescent risky sexual behaviors generally has not considered issues linked to adolescent couple dynamics. The current study was a significant step in this direction.

As noted earlier, this dissertation focused on the interplay of four systems of variables believed to be primary contributors to sexual behavior in adolescent romantic couples; namely factors from, (1) the self-system, (2) the family context, (3) the biological system/context, and (4) the peer context. The above perspective can be summarized in an overarching theoretical model that includes both risk and protective factors in predicting adolescent couple sexual behaviors (see Figure 1). For the sake of simplicity, the model represents hypothesized couple dynamics in terms of a shared influence dynamic, though other forms of influence will be explicitly tested

(e.g., the configural influence model). The model includes hypothesized links between both male and female couple member pubertal timing (actual and perceived), depressive symptoms, adolescent-maternal relationship satisfaction, and couple sexual risk behaviors.

According to Figure 1, both male and female couple members' actual pubertal timing was assumed to directly influence each respective members' perceived pubertal timing (see paths *a* and *b*). Both male and female couple members' actual pubertal timing also was assumed to directly influence each respective member's depressive symptoms (see paths *c* and *d*) and couple sexual risk behaviors (see paths *e* and *f*) independent of this mediator. Both male and female couple members' perceived pubertal timing also was assumed to directly influence each respective member's depressive symptoms (see paths *g* and *h*). Further, both male and female couple members' depressive symptoms are assumed to influence couple sexual risk behaviors (see paths *k* and *l*). Lastly, both male and female couple members' relationship satisfaction with their mothers were assumed to influence each respective members' depressive symptoms and couple sexual risk behaviors (see paths *i*, *j*, *m* and *n*). The present dissertation tested this model and the array of direct and mediated relations implied by it.

In addition to testing the above model, the current study examines several dimensions of adolescent romantic experiences, namely, romantic involvement, partner selection, relationship content, and relationship quality. These dimensions were hypothesized to differ by age, gender, and race/ethnicity. Examining several dimensions of adolescent romantic experiences in the current study answered several

questions such as (1) What percent of adolescents experience a romantic relationship? (2) How homogeneous are the romantic relationships of adolescents? (3) How stable are romantic relationships? (4) What kinds of behaviors typically occur within these relationships? (5) How connected are these relationships to peer and parental relationships? (5) How does romantic relationship behavior vary by the demographic characteristics of adolescents?

## CHAPTER III

### METHODOLOGY

#### *The Add Health Data Set*

Add Health is a school-based study of a nationally representative sample of adolescents in grades 7-12 in 1995 (Wave 1) who are followed up in a second interview approximately one year later in 1996 (Wave 2) and in a third interview in 2001 to 2002 (Wave 3). The focus of the present analysis is on data from the in-home interviews at Wave 1. As detailed below, data from Waves 1 and 3 are available for approximately 15,000 study participants. A slightly smaller number (about 12,500) have data at all three time points because of the decision not to re-interview Wave 1 high school seniors at Wave 2.

Eighty high schools were selected from a sampling frame of 26, 666 high schools in the Quality Education Data, Inc. database. The sample of schools was stratified based on size of the school, school type (e.g., public or private), census region, level of urbanization and percent white. Of the 80 selected high schools, 52 schools agreed to participate and 28 schools did not agreed to participate. The 28 high schools that did not agree to participate were replaced by similar high schools that matched the stratification criteria of the school.

Participating high schools were then asked to identify junior high or middle schools that represented “feeder” schools whose students entered the high school. A single feeder school was selected randomly for each high school with the probability

of selection being proportional to the percentage of the high school's entering class that came from the feeder school. Four schools had no eligible feeder schools because students came from a very large number of junior high or middle schools. Twenty high schools were their own feeder schools, as they had grade ranges that included 7<sup>th</sup> or 8<sup>th</sup> grade. In total, students from 132 discrete schools in grades 7-12 were interviewed throughout the United States.

Approximately 90,000 adolescents representing all of the students who attended the schools on a given day of assessment completed a 45-minute self-administered in-school questionnaire. The interview collected general descriptive information about the student's and parent's background, his or her friends, school life, school work and school activities and general health status, but did not ask about risk behavior. Each school provided a roster of all enrolled students. From the rosters and the pool of participants in the in-home survey, adolescents in grades 7 to 12 were selected to participate in an in-home interview. Adolescents were interviewed at two points in time, first at Wave 1 and then a year later at Wave 2. Active informed consent was obtained for these interviews.

The interviews were a computer assisted personal interview (CAPI) and a computer assisted self-interview (CASI). For more sensitive questions, the adolescent used a headphone attached to a laptop computer. The questions were asked aloud by the computer through the headphones and the adolescent recorded his or her response by pressing an appropriate computer key on the laptop. A parent or guardian also was interviewed at home at Wave 1. The interview with the parent or

guardian provided further information about the family composition and the adolescent's health history. It also asked basic demographic information.

In addition to the core sample (of approximately 12,000 youth), there were several oversamples in Add Health. In some cases, all students in a school were interviewed (called the saturation sample) for purposes of studying friendship networks and romantic attachments. A genetic sample of siblings, twins and unrelated adolescents who resided in the same household was included on the basis of the initial in-school interviews. An oversample of adolescents of African descent with college educated parents was obtained. Finally, an oversample of Cuban American, Puerto Rican, and Chinese adolescents was obtained.

The core sample consisted of roughly equal sized samples drawn from 12 student level strata defined by gender and grade. The overall sample size targets were set for each stratum by dividing the total size of the core sample by the number of strata. School level targets also were set for each stratum by dividing the overall stratum target by the number of schools with at least one student in the stratum. In total, interviews with 20,745 adolescents at Wave 1 were completed. The Wave 2 sample was selected from the pool of participants in Wave 1. The majority of 12<sup>th</sup> grade respondents were removed from the Wave 2 sample because of cost constraints. Parent interviews were not conducted at Wave 2.

The agreement rate for participation in the Add health surveys more generally was 79% at Wave 1 and 88% at Wave 2, with no notable selection biases. Add Health sampling statisticians derived a set of weights to accommodate bias due to

oversampling, non-response, and post-stratification adjustments so as to yield nationally representative estimates of parameters.

### *Romantic Partner Data and Identification of Couples*

As noted earlier, the focus of the present analysis is on data from Wave 1. In the first stage of analyses descriptive data on several dimensions of adolescent romantic experiences were assessed; namely, romantic involvement, partner selection, relationship content, and relationship quality. Respondents between the ages of 12-18 years were selected for the first stage of analyses if they completed interviews at Wave 1 and responded to the following question: In the past 18-months – since (MONTH, YEAR) – have you had a special romantic relationship with anyone?” The total sample for the first stage of analyses consisted of 20,088 respondents [mean age = 15.61 years ( $SD = 1.66$ )].

In the second stage of the study analyses, respondents were selected from the total sample of the first stage of analyses who nominated opposite-sex romantic partners at the same school or feeder school ( $n = 1,252$ ). Each respondent was asked to identify partners in up to three romantic relationships in the past 18-months. The following instructions were given: “The next part of the interview is about your romantic relationships. In the past 18-months – since (MONTH, YEAR) – have you had a special romantic relationship with anyone?” If the respondent answered “yes,” the initials of up to three nominated partners were recorded and questions about the characteristics of the partners and events in the relationships were then asked. If the respondent nominated a partner in the same or feeder school, the nominated partner



was identified by the respondent by picking him or her from the school roster of all eligible students attending the school. Then data from both the respondent and the nominated partner were linked for analyses.

In most cases, when data for couples were linked based on the nominations, a single partner was identified for a given respondent. However, there were cases where multiple nominated partners were linked to a single respondent. Multiple nominated partners were linked to a single respondent when either the respondent nominated more than one partner who was in the study, or when a study participant was nominated as a partner by more than a given respondent. To eliminate most of the multiple nominations in the data, the nominated partner who was described as current was used; if there were still multiple partners, the first romantic partner nomination was selected over the second romantic partner nomination, and the second romantic partner nomination over the third romantic partner nomination. Even after applying these decision rules, 4% of the female partners' and 3% of the male partners' occurred in two couples. Although this introduces some dependence in the observations when analyzed using couples as the unit of analysis, the degree of dependence is small and did not introduce significant bias.

Couples derived from the data are of three types, (1) those where the romantic nomination was reciprocated by both individuals, termed symmetrical couples ( $n = 321$ ), (2) those where the romantic nomination was made by the male but not reciprocated by the female, termed male asymmetrical couples ( $n = 482$ ), and (3) those where the romantic nomination was made by the female but not reciprocated by male, termed female asymmetrical couples ( $n = 449$ ). About one third of the couples

were symmetrical, one third male asymmetrical, and one third female asymmetrical. Fifty-seven percent of the female romantic partners were White, 19% Black, 15% Hispanic, 7% Asian, and 1% Native American. The mean age for symmetric and asymmetric female romantic partners were 16.3 years and 15.4 years, respectively. Fifty-six percent of the male romantic partners were White, 21% Black, 15% Hispanic, 6% Asian, and 1% Native American. The mean age for symmetric and asymmetric male romantic partners were 16.3 years and 16.1 years, see Tables 1 and 2 for additional socio-demographics.

### *Measures*

*Dimensions of Adolescent Romantic Experiences.* Participants were asked several questions about behaviors they have engaged in with their nominated romantic partner. For a given partner, participants were handed a set of cards, each containing a different behavior. The participants then sorted the cards into two piles that described things that had happened and had not happened in their relationship with the nominated partner. These behaviors included questions about romantic involvement, partner selection (e.g., age of partner, race/ethnicity of partner) and relationship content and quality such as whether they “told other people that we were a couple,” “went out together alone,” “kissed,” “held hands,” “gave each other presents,” “told each other you loved each other,” and “thought of yourselves as a couple.” These behaviors were coded 0 for “had not happened” and 1 for “had happened.” For those participants who reported information regarding romantic involvement, partner selection, and relationship content and quality, an index of these behaviors were obtained.

*Couple Sexual Behavior.* Participants were asked several questions about sexual behaviors they have engaged in with their nominated romantic partner. For a given partner, participants were handed a set of cards, each containing a different dating behavior. The participants then sorted the cards into two piles that described things that had happened and had not happened in their relationship with the nominated partner. The measure of whether or not the couple had sex was based on the selection of the card that read, “We had sexual intercourse” as corresponding to an activity that had occurred. This variable was coded 0 for “had not happened” and 1 for “had happened.” For those participants who reported having engaged in sex with a partner, an index of the frequency of sexual intercourse was measured by responses to the question: “About how many times have you and [partner’s initials] had sexual intercourse since [date of first intercourse given by participant]?” This variable was coded as the exact number provided by the participant ranging from 0 to 999. An index of consistent birth control also was obtained. Participants were asked if they had ever used birth control with their partner and if the answer was “yes,” they were then asked “Did one or the other of you use some method of birth control every time you and [partner’s initials] had intercourse?” Responses to this question were coded 0 for “no” and 1 for “yes.” Responses of “no” to the question of whether or not birth control had ever been used were also coded as zero.

*Adolescent-Maternal Relationship Satisfaction.* The extent to which adolescents were satisfied with their relationship with their mothers was measured with the following item: “Overall, I am satisfied with my relationship with my mother.” Participants responded to this statement on a 5-point agree-disagree scale

and it was scored 1 to 5 such that higher numbers indicated greater agreement. A separate rating was obtained with respect to the mother and the father. These scales have been found in other research to be correlated with more complex measures of parental relationship satisfaction. In addition, numerous publications have found the measures to be predictive of sexual activity prospectively (see Jaccard, Dittus, & Gordon, 2000). Adolescent ratings obtained with respect to the mother were used in the present study.

*Actual Pubertal Development.* Participants were asked to describe the extent of their physical maturity by responding to a number of statements. An overall index of pubertal development was formed within each gender by averaging the responses across the items. A total of 3-items was used to create an overall index of pubertal development for males. The items focused on how much hair had grown under his arms, how much hair had grown on his face, and to what degree his voice was lower than it had been in grade school. A total of 3-items was used to create an overall index of pubertal development for females. The items measured to what degree the respondent's breasts had developed, how curved her body had become, and whether her menstrual cycle began. Both male and female participants responded to each question on a 5-point scale to yield an overall index of pubertal development that can range from 3 to 15. Higher numbers indicated more advanced pubertal development. Measures based on this approach have been used in numerous studies on physical development (Morris & Udry, 1980; Udry, Talbert, & Morris, 1986) and are typically highly correlated with more detailed measures based on direct physical observations.

*Perceived Pubertal Timing.* Participants were asked to describe the extent of their physical maturity relative to their same sex and same age peers: “Overall how advanced is your physical development compared to other boys (girls) your age.” Participants responded to this question on a 5-point scale, ranging from 1 (I look younger than most) to 5 (I look older than most). Higher numbers indicated greater perception that one’s pubertal development was earlier relative to same sex and same age peers. Studies have demonstrated reasonable confidence in the reliability and validity of youths’ perceptions of their pubertal timing (Dubas, Graber, & Petersen, 1991; Graber et al., 1997) using a single item. Graber et al. (1997), for example, found acceptable test-retest reliability of girls’ perceived pubertal timing over 1-year ( $r = 0.61$ ).

*Adolescent Depressive Symptoms.* Adolescents were administered the Center for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977). The CES-D is a well-validated and widely used 20-item self-report instrument developed to measure symptoms of depression within community samples. Four Add Health modifications were made to the CES-D: two items measured symptoms in past year rather than past week and two items used slightly different wording than the CES-D. The scale is valid for use in high school student populations (Radloff, 1991; Roberts, Lewinsohn, & Seeley, 1991). Participants responded to each question on a 3-point scale, ranging from zero (never) to three (all the time) to yield a total score that can range from 0 to 33. In the present sample, the coefficient alpha of this scale was 0.87.

*Adolescent Social Desirability.* The tendency for adolescents to respond to items in a socially desirable manner was measured using three items: "I never argue

with anyone," "I never get sad," and "I never criticize other people." These statements are generally untrue of everyone. If a respondent is trying to create a favorable impression by distorting his or her answers, he or she would tend to agree with these statements. Respondents answered each question on a 5-point, agree-disagree scale, with 5 indicating the highest degree of a socially desirable response. The [alpha] coefficient for the scale was .63. An overall score was derived by averaging the three items. The items used in the current study to assess adolescent social desirability were based on the work of Paulhus (1991) and were shortened for use in this large national survey. Adolescent social desirability was used as a covariate in the study SEM models.

#### *Data Analytic Plan*

*Missing Data.* Missing data were expected to be minimal for most variables. Given missing data, parameter estimates and model tests were pursued in the context of Full Information Maximum Likelihood (FIML) methods as implemented in Mplus (Muthen & Muthen, 1998). Missing data bias were assessed by computing a dummy variable coded for each respondent as 1 = has a missing value on the variable in question and 0 = does not have a missing value and then tests for associations between the dummy variables and other variables in the model.

*Outliers.* Outlier analyses were undertaken prior to all major analyses. The analyses were both non-model based and model based. For the former, multivariate outliers were identified by examining leverage indices for each individual and defining an outlier as a leverage score four times greater than the mean leverage. An

additional set of outlier analyses were pursued using model-based outlier analysis. This involved selecting an indicator for each latent variable (or, for the case of single indicators, using the only indicator available) and then regressing the indicator for each endogenous variable onto the indicators for variables of which the endogenous variable is assumed to be a linear function. This analysis used an ordinary least squares regression in a limited information estimation framework. Standardized dfbetas were examined for each individual and each predictor as well as the intercept. An outlier was defined as anyone with an absolute standardized dfbeta larger than 1.0.

Furthermore, model diagnostics were explored to protect against gross model misspecification. In addition, evaluation of the coefficient alphas and factor structures for all of the multi-item measures were evaluated to ensure they were behaving in a way that one would expect based on their psychometric histories. The intercorrelations of variables and results of exploratory or confirmatory factor analyses were also used to make decisions about potentially combining indices.

*Non-normality.* Multivariate normality was evaluated using Mardia's test for multivariate normality. In addition, univariate indices of skewness and kurtosis were examined to determine if the absolute value of any of these indices was greater than 2.0. If non-normality appeared to be problematic, then bootstrapping was pursued as a remedy. P-values and confidence intervals were estimated using bias-corrected methods. The number of bootstrap replications was 2000. In place of the traditional Chi Square test, the Bollen-Stine bootstrapped version of the test was performed.

*Measurement Error.* Given that measurement error can bias parameter estimates, where possible, analytic strategies were adopted that explicitly modeled measurement error. For single indicator SEM, this was accommodated by fixing error variances of measures at *a priori* specified values that map onto the reliability of these measures suggested by previous research (see Joreskog & Sorbom, 1996, for a description of this approach). Or, if it is a multi-item measure, multiple indicators using split-half methods, as described in Jaccard and Wan (1996) were applied.

*Indices of Fit.* Following the recommendations of Bollen and Long (1993), a variety of global fit indices were used, including indices of absolute fit, indices of relative fit and indices of fit with a penalty function for lack of parsimony. These include the traditional overall chi square test of model fit (which should be statistically non-significant), the Root Mean Square Error of Approximation (RMSEA; which should be less than 0.08 to declare satisfactory fit), the p value for the test of close fit (which should be statistically non-significant), the Comparative Fit Index (CFI; which should be greater than 0.95); the traditional Goodness of Fit Index (GFI, which should be greater than 0.90) and the standardized root mean square residual (which should be less than 0.05).

In addition to the global fit indices, more focused tests of fit were pursued. These include examination of the standardized residual covariances (which should be between -2.00 and 2.00) and modification indices (which should be less than 4.00). The parameter estimates also were examined for Heywood cases. Care was taken to ensure was no specification error.



*Statistical Power and Sample Size Considerations.* In terms of sample size requirements for the study analyses, the sample size of 1,252 yielded satisfactory statistical power for the major analyses. In terms of power, it is difficult to evaluate the power associated with specific path coefficients in complex SEM models because of the large number of assumptions about population parameters that must be made and because it is a full information estimation strategy. A rough approximation of power can be obtained by using a limited information approach. This permits the use of traditional power analysis software to gain a sense of sample size demands (Jaccard & Wan, 1996). In the examples below, an alpha level of 0.05 and a two tailed test is assumed and power analysis parameters are used that are likely to be operative in the linear models implied by Figure 1.

For a multiple regression analysis with 6 predictors where the squared multiple correlation is 0.15 and where one wants to detect a predictor that accounts for at least 5% unique variance in the outcome, the required sample size to achieve power of 0.80 is approximately 140. For a logistic regression analysis where the target predictor is a continuous predictor with four other predictors in the equation, where the event rate at the mean of all predictors is 0.10 and where the multiple correlation of the predictor with the other predictors is 0.30, the sample size needed to detect an odds ratio of 1.75 expressed in standardized metrics is about 170 and for an odds ratio in standardized metrics of 2.00 is about 110. For a simple zero order correlation of 0.30 in the population, the sample size needed to achieve power of 0.80 is approximately 80. The sample size in Add Health seems adequate for all of the proposed analyses in terms of statistical power.

In terms of asymptotic theory and covariance stability, simulation studies tend to suggest that sample sizes of 100 to 125 or larger often yield adequate results given that reasonably reliable measures are used (reliabilities greater than 0.65) and with a reasonable number of indicators per latent variable (Jackson, 2003; Jaccard & Wan, 1996). The sample size in the proposed study exceeds this standard. Further, the statistical modeling included covariates, such as gender, social class, ethnicity, age of the respondents, and couple type (symmetric, male asymmetric, female asymmetric) even though these are not shown in Figure 1.

## CHAPTER IV

### RESULTS

The results section is organized into four major sections. The first section reports preliminary analyses (i.e., outlier analyses, non-normality, and missing data). The second section reports analyses on the dimensions of adolescent romantic experiences (i.e., romantic involvement, partner selection, relationship content, and relationship quality) for adolescents in a romantic relationship. The third section reports couple-based analyses on the age discrepancies of partners', sexual behavior of couples', and level of agreement on reports of couples' sexual behavior. The fourth section reports SEM analyses on the proposed risk and protective model for predicting sexual risk-promoting and risk-reducing behavior in adolescent romantic couples'.

#### *Preliminary Analyses*

*Outliers.* Prior to analysis, the data were evaluated for multivariate outliers by examining leverage indices for each individual and defining an outlier as a leverage score four times greater than the mean leverage. No outliers were detected. An additional set of outlier analyses was pursued using model-based outlier analysis. This involved regressing the indicator for each endogenous variable onto the indicators for variables of which the endogenous variable was assumed to be a linear function. Model-based outlier analysis used ordinary least squares regression in a limited information estimation framework. Standardized  $dfbetas$  also were examined for each individual and each predictor (as well as the intercept). An outlier was

defined as any case with an absolute standardized *dfbeta* larger than 1.0. Outliers were detected within couple reports of frequency of sexual intercourse because a few partners reported an unusually large number of instances of sexual intercourse. An outlier robust index of correlation between the male and female couple members' reports was calculated; results are discussed below in the section on couple-based analyses.

*Non-Normality.* Multivariate normality was evaluated using Mardia's index. The *p* value for the multivariate index was statistically non-significant ( $p > 0.05$ ). Examination of univariate indices of skewness and kurtosis revealed skewness values above an absolute value of 1.5 and kurtosis values greater than 2.0. Because non-normality was present, the SEM models were evaluated using bootstrapping with 2000 bootstrap replicates. A bootstrapped linear probability model (Long, 1997) was pursued because some of the outcome variables were dichotomous. Results presented later for the SEM models report the bootstrapped coefficients.

*Missing Data.* Missing data were minimal for most variables. Values for missing data were imputed using the Expectation Maximization method as described in King, Honaker, Joseph, and Scheve (2001).

#### *Dimensions of Adolescent Romantic Experiences*

*Romantic Involvement.* Table 3 provides estimates of the percent of adolescents who had experienced a romantic relationship in the last 18 months. Approximately 56% of all adolescents in the current study reported having had a romantic relationship. Relationship prevalence was significantly higher in adolescent

girls (57%) compared to adolescent boys (54%); ( $z = 4.263, p < .05$ ; 95% CI of the difference = 0.0214 to 0.049). The percent of adolescents to report romantic involvement increased monotonically with age, with 27-30% of adolescents' age 12 years reporting romantic involvement compared to 68-75% of adolescents age 18 years.

Relationship prevalence was significantly higher in adolescent girls age 15 and older compared to similarly aged adolescent boys. Relationship prevalence was significantly higher in adolescent girls age 15 compared to adolescent boys age 15 ( $z = 3.705, p < .05$ ; 95% CI of the difference = 0.029 to 0.095). Relationship prevalence was significantly higher in adolescent girls age 16 compared to adolescent boys age 16 ( $z = 4.907, p < .05$ ; 95% CI of the difference = 0.046 to 0.107). Relationship prevalence was significantly higher in adolescent girls age 17 compared to adolescent boys age 17 ( $z = 4.778, p < .05$ ; 95% CI of the difference = 0.042 to 0.101). Relationship prevalence was significantly higher in adolescent girls age 18 compared to adolescent boys age 18 ( $z = 4.372, p < .05$ ; 95% CI of the difference = 0.040 to 0.105). Although before age 15 adolescent boys reported higher rates of romantic involvement compared to adolescent girls, the differences were not significant.

The percent of adolescents to report romantic involvement varied significantly across racial/ethnic groups, see Table 4. Relationship prevalence was significantly higher in White adolescents compared to Black ( $z = 6.76, p < .05$ ; 95% CI for the difference = 0.0467 to 0.0813), Hispanic ( $z = 1.99, p < .05$ ; 95% CI for the difference = 0.0026 to 0.0413), and Asian adolescents ( $z = 9.76, p < .05$ ; 95% CI for the difference = 0.1207 to 0.1764). Relationship prevalence was significantly higher in

Black adolescents compared to Hispanic ( $z = 3.44, p < .05$ ; 95% CI for the difference = 0.0197 to 0.0644), Asian ( $z = 5.13, p < .05$ ; 95% CI for the difference = 0.0546 to 0.1146), and 'Other' ( $z = 2.89, p < .05$ ; 95% CI for the difference = 0.021 to 0.1523) adolescents.

Relationship prevalence was significantly higher in Hispanic adolescents compared to Asian ( $z = 7.38, p < .05$ ; 95% CI for the difference = 0.0954 to 0.1579) and 'Other' ( $z = 1.70, p < .05$ ; 95% CI for the difference = -0.0217 to 0.1108) adolescents. Relationship prevalence was significantly higher in Asian adolescents compared to Native American ( $z = 3.66, p < .05$ ; 95% CI for the difference = 0.0668 to 0.2149) and 'Other' ( $z = 4.80, p < .05$ ; 95% CI for the difference = 0.1022 to 0.2406) adolescents. Relationship prevalence was not significantly different by sex and racial/ethnic groups.

*Partner Selection.* Table 5 is concerned with the characteristics of the person with whom an adolescent has a romantic relationship. The mean age of nominated romantic partners' in this study sample was age 16 years. Adolescent girls reported romantic partners' that were significantly older than the age of romantic partners reported by adolescent boys ( $t(12669) = 36.29, p < .001$ ). Age of romantic partners increased significantly with age ( $F(6) = 729.099, p < .001$ ), with younger adolescents reporting younger romantic partners' than the age of romantic partners reported by older adolescents.

Table 5 also presents an age difference score. This score was defined for adolescents by subtracting the age of the nominated romantic partners' from the age

of the respondent. A negative score indicates that the nominated romantic partners were older than the respondent and a positive score indicates that the respondent was older than the nominated romantic partners. On average, adolescent boys were slightly older (by 0.97 years) than their nominated romantic partners and adolescent girls were slightly younger (by -0.57 years) than their nominated romantic partners.

The mean duration of adolescent relationships' in this study sample was about 8 months. Relationship duration was not significantly different by sex. Adolescent boys and girls reported similar relationship durations, 8.06 and 8.44, respectively. Relationship duration varied significantly by age ( $F(6) = 7.512, p < .001$ ). Adolescents' age 17 years reported significantly longer relationships than adolescents' age 15 years, 9 months and 7 months respectively. Adolescents' age 18 years reported significantly longer relationships (11 months) than adolescents' age 13 years (7 months), 14 years (7 months), 15 years (7 months), and 16 years (8 months).

As shown in Table 6, mean age of romantic partners varied significantly by racial/ethnic group ( $F(5) = 10.18, p < .001$ ). Hispanic adolescents reported significantly older romantic partners than the age of romantic partners reported by White, Black, and Native American adolescents. Native American adolescents reported significantly younger romantic partners than the age of romantic partners' reported by 'Other' adolescents.

Relationship duration also varied significantly by racial/ethnic group ( $F(5) = 8.36, p < .001$ ). Black adolescents reported significantly longer relationships' than White, Hispanic, and Asian adolescents. Native American adolescents were more

likely to report romantic partners from a different racial/ethnic group; while White, Black, Hispanic, Asian, and ‘Other’ adolescents were less likely, see Table 7.

Table 8 describes how adolescents met their romantic partners. Most adolescents met their partners in school (49%), through mutual friends (40%), or they were already friends (40%). Adolescents were less likely to meet their partners in their neighborhood (5%) or at a place of worship (6%). Adolescent boys were significantly more likely than adolescent girls to meet their partners in school ( $z = 5.639, p < .05$ ; 95% CI of the difference = 0.033 to 0.068). Adolescent girls were significantly more likely than adolescent boys to already be friends with their partners’ ( $z = 3.437, p < .05$ ; 95% CI of the difference = 0.033 to 0.068) and meet their partners’ through mutual friends ( $z = 12.641, p < .05$ ; 95% CI of the difference = 0.033 to 0.068).

Adolescents across all age groups were more likely to meet their partners in school. The percent of adolescents to meet their partners in school decreased significantly with age, with younger adolescents meeting their partners in school more often than older adolescents. Adolescents age 12 years were significantly more likely to meet their partners in school than adolescents age 13 years ( $z = 1.852, p < .05$ ), 14 years ( $z = 2.882, p < .05$ ), 15 years ( $z = 3.673, p < .05$ ), 16 years ( $z = 4.449, p < .05$ ), 17 years ( $z = 4.973, p < .05$ ), and 18 years ( $z = 5.715, p < .05$ ).

Adolescents across all racial/ethnic groups were also more likely to meet their partners in school, see Table 9. White adolescents were significantly more likely to meet their partners’ in school than Black ( $z = 6.316, p < .05$ ), Hispanic ( $z = 7.302, p <$



.05), and Asian adolescents ( $z = 2.932, p < .05$ ). No other statistically significant differences were found by age or racial/ethnic group on how adolescents' meet their romantic partners'.

*Relationship Content.* Table 10 provides data on various acts of intimacy and commitment within adolescent romantic relationships. Most adolescents characterized their relationships by a great deal of emotional involvement, including expressions of love, thinking of themselves as a couple, going out together alone, and exchanging gifts. Most adolescents in this study considered themselves a couple (91%), but were less likely to relinquish spending time with their other friends to spending time with their romantic partners' (54%).

Adolescent girls were significantly more likely than boys to report thinking of themselves as a couple ( $z = 6.208, p < .05$ ) and seeing less friends ( $z = 5.544, p < .05$ ). Adolescent boys were significantly more likely than girls to report going out alone with their romantic partners' ( $z = 2.656, p < .05$ ) and giving their partners' a present ( $z = 4.867, p < .05$ ). For the above findings, the 95% CI of the difference = 0.031 to 0.063. No other statistically significant differences were found by sex on acts of intimacy and commitment within adolescent romantic relationships'.

Table 10 also shows age variation with respect to acts of intimacy and commitment within adolescent romantic relationships. Younger adolescents compared to older adolescents were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners.

Adolescents age 12 years were significantly less likely to relinquish spending time

with their other friends to spending time with their romantic partners than adolescents age 15 years ( $z = 2.587, p < .05$ ; 95% CI of the difference = 0.025 to 0.187), 16 years ( $z = 3.587, p < .05$ ; 95% CI of the difference = 0.075 to 0.236), 17 years ( $z = 4.876, p < .05$ ; 95% CI of the difference = 0.122 to 0.282), and 18 years ( $z = 5.636, p < .05$ ; 95% CI of the difference = 0.145 to 0.307).

Adolescents age 12 years were also significantly less likely to go out alone with their romantic partners' than adolescents age 14 years ( $z = 2.412, p < .05$ ; 95% CI of the difference = 0.020 to 0.188), 15 years ( $z = 5.123, p < .05$ ; 95% CI of the difference = 0.114 to 0.278), 16 years ( $z = 7.817, p < .05$ ; 95% CI of the difference = 0.186 to 0.349), 17 years ( $z = 10.811, p < .05$ ; 95% CI of the difference = 0.245 to 0.406), and 18 years ( $z = 10.915, p < .05$ ; 95% CI of the difference = 0.249 to 0.411). Lastly, adolescents age 12 years were significantly more likely to give their romantic partners a gift than adolescents age 13 years ( $z = 2.919, p < .05$ ; 95% CI of the difference = 0.043 to 0.208).

Adolescents age 13 years were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners than adolescents age 14 years ( $z = 3.226, p < .05$ ; 95% CI of the difference = 0.028 to 0.112), 15 years ( $z = 5.917, p < .05$ ; 95% CI of the difference = 0.075 to 0.153), 16 years ( $z = 8.097, p < .05$ ; 95% CI of the difference = 0.125 to 0.201), 17 years ( $z = 10.802, p < .05$ ; 95% CI of the difference = 0.172 to 0.247), and 18 years ( $z = 12.025, p < .05$ ; 95% CI of the difference = 0.195 to 0.272).

Adolescents age 13 years were also significantly less likely to go out alone with their romantic partners than adolescents age 14 years ( $z = 4.882, p < .05$ ; 95% CI of the difference = 0.062 to 0.147), 15 years ( $z = 10.356, p < .05$ ; 95% CI of the difference = 0.158 to 0.235), 16 years ( $z = 15.446, p < .05$ ; 95% CI of the difference = 0.231 to 0.305), 17 years ( $z = 20.444, p < .05$ ; 95% CI of the difference = 0.290 to 0.362), and 18 years ( $z = 19.803, p < .05$ ; 95% CI of the difference = 0.294 to 0.367).

Adolescents age 14 years were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners than adolescents age 15 years ( $z = 2.879, p < .05$ ; 95% CI of the difference = 0.010 to 0.078), 16 years ( $z = 5.405, p < .05$ ; 95% CI of the difference = 0.060 to 0.126), 17 years ( $z = 8.599, p < .05$ ; 95% CI of the difference = 0.108 to 0.172), and 18 years ( $z = 10.05, p < .05$ ; 95% CI of the difference = 0.131 to 0.197).

Adolescents age 14 years were also significantly less likely to go out alone with their romantic partners than adolescents age 15 years ( $z = 5.783, p < .05$ ; 95% CI of the difference = 0.060 to 0.124), 16 years ( $z = 11.317, p < .05$ ; 95% CI of the difference = 0.134 to 0.197), 17 years ( $z = 16.646, p < .05$ ; 95% CI of the difference = 0.193 to 0.250), and 18 years ( $z = 16.092, p < .05$ ; 95% CI of the difference = 0.197 to 0.255). Lastly, adolescents age 14 years were significantly more likely to give their romantic partners a gift than adolescents age 13 years ( $z = 2.876, p < .05$ ; 95% CI of the difference = 0.020 to 0.105).

Adolescents age 15 years were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners than

adolescents age 16 years ( $z = 2.719, p < .05$ ; 95% CI of the difference = 0.020 to 0.078), 17 years ( $z = 6.315, p < .05$ ; 95% CI of the difference = 0.068 to 0.124), and 18 years ( $z = 8.013, p < .05$ ; 95% CI of the difference = 0.090 to 0.149). Adolescents age 15 years were also significantly less likely to go out alone with their romantic partners than adolescents age 16 years ( $z = 5.808, p < .05$ ; 95% CI of the difference = 0.047 to 0.096), 17 years ( $z = 11.464, p < .05$ ; 95% CI of the difference = 0.107 to 0.152), and 18 years ( $z = 11.178, p < .05$ ; 95% CI of the difference = 0.111 to 0.158). Lastly, adolescents age 15 years were significantly more likely to give their romantic partners a gift than adolescents age 14 years ( $z = 3.24, p < .05$ ; 95% CI of the difference = 0.021 to 0.087), and 13 years ( $z = 5.922, p < .05$ ; 95% CI of the difference = 0.077 to 0.157).

Adolescents age 16 years were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners than adolescents age 17 years ( $z = 3.707, p < .05$ ; 95% CI of the difference = 0.021 to 0.073), and 18 years ( $z = 5.626, p < .05$ ; 95% CI of the difference = 0.043 to 0.099). Adolescents age 16 years were also significantly less likely to go out alone with their romantic partners than adolescents age 17 years ( $z = 5.747, p < .05$ ; 95% CI of the difference = 0.038 to 0.078), and 18 years ( $z = 5.862, p < .05$ ; 95% CI of the difference = -0.014 to 0.024). Lastly, adolescents age 16 years were significantly more likely to give their romantic partners a gift than adolescents age 15 years ( $z = 3.518, p < .05$ ; 95% CI of the difference = 0.021 to 0.075), 14 years ( $z = 6.533, p < .05$ ; 95% CI of the difference = 0.071 to 0.133), and 13 years ( $z = 8.839, p < .05$ ; 95% CI of the difference = 0.126 to 0.202).

Adolescents age 17 years were significantly less likely to relinquish spending time with their other friends to spending time with their romantic partners than adolescents age 18 years ( $z = 2.16, p < .05$ ; 95% CI of the difference = -0.003 to 0.051). Adolescents age 17 years were also significantly more likely to give their romantic partners a gift than adolescents age 12 years ( $z = 2.364, p < .05$ ; 95% CI of the difference = 0.013 to 0.161), 13 years ( $z = 12.187, p < .05$ ; 95% CI of the difference = 0.178 to 0.252), 14 years ( $z = 10.325, p < .05$ ; 95% CI of the difference = 0.123 to 0.183), 15 years ( $z = 7.683, p < .05$ ; 95% CI of the difference = 0.073 to 0.124), and 16 years ( $z = 4.259, p < .05$ ; 95% CI of the difference = 0.027 to 0.074).

Adolescents age 18 years were significantly more likely to give their romantic partners a gift than adolescents age 12 years ( $z = 3.751, p < .05$ ; 95% CI of the difference = 0.055 to 0.209), 13 years ( $z = 14.472, p < .05$ ; 95% CI of the difference = 0.219 to 0.294), 14 years ( $z = 12.87, p < .05$ ; 95% CI of the difference = 0.164 to 0.225), 15 years ( $z = 10.562, p < .05$ ; 95% CI of the difference = 0.114 to 0.166), 16 years ( $z = 7.481, p < .05$ ; 95% CI of the difference = 0.068 to 0.116), 17 years ( $z = 3.56, p < .05$ ; 95% CI of the difference = 0.019 to 0.064).

No other statistically significant differences were found by age on acts of intimacy and commitment within adolescent romantic relationships. Further, no statistically significant differences were found by race/ethnicity on acts of intimacy and commitment within adolescent romantic relationships. Adolescent across all racial/ethnic groups were equally likely to characterize their relationships by a great deal of emotional involvement, including expressions of love, thinking of themselves as a couple, going out together alone, and exchanging gifts.

Table 11 summarizes various dimensions of sexual behavior within adolescent romantic relationships. Consistent with the notion that sexual intercourse follows other ‘lighter’ sexual behaviors, adolescents in this study reported more holding hands (89%), kissing each other (91%), touching each other under clothing (63%), and touching each other’s genitals (54%) than actual sexual intercourse (42%). No statistically significant differences were found by sex on sexual behaviors within adolescent romantic relationships. Adolescent girls and boys were equally likely to report engaging in various sexual behaviors with their partners’.

Sexual behaviors within adolescent romantic relationships increased significantly with age, with older adolescents reporting more engagement in these behaviors than younger adolescents. Adolescents age 18 years were significantly more likely to kiss their romantic partners than adolescents age 17 years ( $z = 1.675, p < .05$ ; 95% CI of the difference = -0.002 to 0.024), 16 years ( $z = 2.281, p < .05$ ; 95% CI of the difference = -0.002 to 0.030), 15 years ( $z = 5.553, p < .05$ ; 95% CI of the difference = 0.028 to 0.06), 14 years ( $z = 9.005, p < .05$ ; 95% CI of the difference = 0.066 to 0.107), 13 years ( $z = 13.892, p < .05$ ; 95% CI of the difference = 0.137 to 0.196), and 12 years ( $z = 7.422, p < .05$ ; 95% CI of the difference = 0.092 to 0.223).

Adolescents age 18 years were also significantly more likely to touch their partners under clothing than adolescents age 17 years ( $z = 1.675, p < .05$ ; 95% CI of the difference = 0.020 to 0.067), 16 years ( $z = 2.281, p < .05$ ; 95% CI of the difference = 0.101 to 0.151), 15 years ( $z = 5.553, p < .05$ ; 95% CI of the difference = 0.203 to 0.258), 14 years ( $z = 9.005, p < .05$ ; 95% CI of the difference = 0.316 to

0.379), 13 years ( $z = 13.892, p < .05$ ; 95% CI of the difference = 0.466 to 0.536), and 12 years ( $z = 7.422, p < .05$ ; 95% CI of the difference = 0.416 to 0.566).

Adolescents age 18 years were also significantly more likely to touch their partners genitals than adolescents age 17 years ( $z = 1.675, p < .05$ ; 95% CI of the difference = 0.038 to 0.089), 16 years ( $z = 2.281, p < .05$ ; 95% CI of the difference = 0.134 to 0.188), 15 years ( $z = 5.553, p < .05$ ; 95% CI of the difference = 0.229 to 0.286), 14 years ( $z = 9.005, p < .05$ ; 95% CI of the difference = 0.348 to 0.410), 13 years ( $z = 13.892, p < .05$ ; 95% CI of the difference = 0.486 to 0.552), and 12 years ( $z = 7.422, p < .05$ ; 95% CI of the difference = 0.521 to 0.637).

Lastly, adolescents age 18 years were significantly more likely have sex with their partners than adolescents age 17 years ( $z = 1.675, p < .05$ ; 95% CI of the difference = 0.053 to 0.107), 16 years ( $z = 2.281, p < .05$ ; 95% CI of the difference = 0.163 to 0.218), 15 years ( $z = 5.553, p < .05$ ; 95% CI of the difference = 0.282 to 0.338), 14 years ( $z = 9.005, p < .05$ ; 95% CI of the difference = 0.393 to 0.451), 13 years ( $z = 13.892, p < .05$ ; 95% CI of the difference = 0.471 to 0.531), and 12 years ( $z = 7.422, p < .05$ ; 95% CI of the difference = 0.509 to 0.60).

Adolescents age 17 years were significantly more likely to kiss their romantic partners than adolescents age 15 years ( $z = 4.222, p < .05$ ; 95% CI of the difference = 0.017 to 0.049), 14 years ( $z = 7.993, p < .05$ ; 95% CI of the difference = 0.054 to 0.095), 13 years ( $z = 13.218, p < .05$ ; 95% CI of the difference = 0.126 to 0.185), and 12 years ( $z = 6.474, p < .05$ ; 95% CI of the difference = 0.080 to 0.212). Adolescents age 17 years were also significantly more likely to touch their partners under clothing

than adolescents age 15 years ( $z = 4.222, p < .05$ ; 95% CI of the difference = 0.161 to 0.214), 14 years ( $z = 7.993, p < .05$ ; 95% CI of the difference = 0.273 to 0.335), 13 years ( $z = 13.218, p < .05$ ; 95% CI of the difference = 0.423 to 0.492), and 12 years ( $z = 6.474, p < .05$ ; 95% CI of the difference = 0.373 to 0.522).

Adolescents age 17 years were also significantly more likely to touch their partners genitals than adolescents age 15 years ( $z = 4.222, p < .05$ ; 95% CI of the difference = 0.167 to 0.222), 14 years ( $z = 7.993, p < .05$ ; 95% CI of the difference = 0.285 to 0.346), 13 years ( $z = 13.218, p < .05$ ; 95% CI of the difference = 0.424 to 0.488), and 12 years ( $z = 6.474, p < .05$ ; 95% CI of the difference = 0.458 to 0.574). Lastly, adolescents age 17 years were significantly more likely have sex with their partners than adolescents age 15 years ( $z = 4.222, p < .05$ ; 95% CI of the difference = 0.020 to 0.257), 14 years ( $z = 7.993, p < .05$ ; 95% CI of the difference = 0.314 to 0.370), 13 years ( $z = 13.218, p < .05$ ; 95% CI of the difference = 0.392 to 0.450), and 12 years ( $z = 6.474, p < .05$ ; 95% CI of the difference = 0.430 to 0.519).

Adolescents age 16 years were significantly more likely to kiss their romantic partners than adolescents age 15 years ( $z = 3.474, p < .05$ ; 95% CI of the difference = 0.012 to 0.044), 14 years ( $z = 7.204, p < .05$ ; 95% CI of the difference = 0.049 to 0.091), 13 years ( $z = 12.339, p < .05$ ; 95% CI of the difference = 0.121 to 0.180), and 12 years ( $z = 6.045, p < .05$ ; 95% CI of the difference = 0.076 to 0.208). Adolescents age 16 years were also significantly more likely to touch their partners under clothing than adolescents age 15 years ( $z = 3.474, p < .05$ ; 95% CI of the difference = 0.077 to 0.133), 14 years ( $z = 7.204, p < .05$ ; 95% CI of the difference = 0.189 to 0.253), 13



years ( $z = 12.339, p < .05$ ; 95% CI of the difference = 0.339 to 0.411), and 12 years ( $z = 6.045, p < .05$ ; 95% CI of the difference = 0.290 to 0.440).

Adolescents age 16 years were also significantly more likely to touch their partners genitals than adolescents age 15 years ( $z = 3.474, p < .05$ ; 95% CI of the difference = 0.068 to 0.125), 14 years ( $z = 7.204, p < .05$ ; 95% CI of the difference = 0.186 to 0.249), 13 years ( $z = 12.339, p < .05$ ; 95% CI of the difference = 0.324 to 0.391), and 12 years ( $z = 6.045, p < .05$ ; 95% CI of the difference = 0.359 to 0.476). Lastly, adolescents age 16 years were significantly more likely have sex with their partners than adolescents age 15 years ( $z = 3.474, p < .05$ ; 95% CI of the difference = 0.092 to 0.147), 14 years ( $z = 7.204, p < .05$ ; 95% CI of the difference = 0.203 to 0.260), 13 years ( $z = 12.339, p < .05$ ; 95% CI of the difference = 0.281 to 0.339), and 12 years ( $z = 6.045, p < .05$ ; 95% CI of the difference = 0.319 to 0.409).

Adolescents' age 15 years were significantly more likely to kiss their romantic partners than adolescents age 14 years ( $z = 3.778, p < .05$ ; 95% CI of the difference = 0.020 to 0.064), 13 years ( $z = 8.867, p < .05$ ; 95% CI of the difference = 0.092 to 0.153), and 12 years ( $z = 4.103, p < .05$ ; 95% CI of the difference = 0.047 to 0.180). Adolescents age 15 years were also significantly more likely to touch their partners under clothing than adolescents age 14 years ( $z = 3.778, p < .05$ ; 95% CI of the difference = 0.083 to 0.150), 13 years ( $z = 8.867, p < .05$ ; 95% CI of the difference = 0.233 to 0.307), and 12 years ( $z = 4.103, p < .05$ ; 95% CI of the difference = 0.184 to 0.336).

Adolescents age 15 years were also significantly more likely to touch their partners genitals than adolescents age 14 years ( $z = 3.778, p < .05$ ; 95% CI of the difference = 0.088 to 0.154), 13 years ( $z = 8.867, p < .05$ ; 95% CI of the difference = 0.227 to 0.296), and 12 years ( $z = 4.103, p < .05$ ; 95% CI of the difference = 0.262 to 0.381). Lastly, adolescents age 15 years were significantly more likely have sex with their partners than adolescents age 14 years ( $z = 3.778, p < .05$ ; 95% CI of the difference = 0.083 to 0.141), 13 years ( $z = 8.867, p < .05$ ; 95% CI of the difference = 0.161 to 0.221), and 12 years ( $z = 4.103, p < .05$ ; 95% CI of the difference = 0.200 to 0.29).

Adolescents age 14 years were significantly more likely to kiss their romantic partners than adolescents age 13 years ( $z = 4.88, p < .05$ ; 95% CI of the difference = 0.047 to 0.114), and 12 years ( $z = 2.078, p < .05$ ; 95% CI of the difference = 0.004 to 0.140). Adolescents age 14 years were also significantly more likely to touch their partners under clothing than adolescents age 13 years ( $z = 4.88, p < .05$ ; 95% CI of the difference = 0.113 to 0.194), and 12 years ( $z = 2.078, p < .05$ ; 95% CI of the difference = 0.067 to 0.221). Adolescents age 14 years were also significantly more likely to touch their partners genitals than adolescents age 13 years ( $z = 4.88, p < .05$ ; 95% CI of the difference = 0.103 to 0.177), and 12 years ( $z = 2.078, p < .05$ ; 95% CI of the difference = 0.140 to 0.261). Lastly, adolescents age 14 years were significantly more likely have sex with their partners than adolescents age 13 years ( $z = 4.88, p < .05$ ; 95% CI of the difference = 0.048 to 0.109), and 12 years ( $z = 2.078, p < .05$ ; 95% CI of the difference = 0.087 to 0.178).

Table 11 also shows racial/ethnic group variation with respect to sexual behaviors within adolescent romantic relationships. Adolescents across all racial/ethnic groups were equally likely to report holding hands and kissing their romantic partners. Asian adolescents were significantly less likely to touch their partners' under clothing than White ( $z = 3.799, p < .05$ ; 95% CI of the difference = 0.036 to 0.117) and Black adolescents ( $z = 3.769, p < .05$ ; 95% CI of the difference = 0.038 to 0.124). Asian adolescents were also significantly less likely to touch their partners' genitals than White ( $z = 4.461, p < .05$ ; 95% CI of the difference = 0.051 to 0.133), Black ( $z = 4.701, p < .05$ ; 95% CI of the difference = 0.06 to 0.147) and Hispanic adolescents ( $z = 2.876, p < .05$ ; 95% CI of the difference = 0.021 to 0.110).

Black adolescents were significantly more likely to have sex with their partners than White ( $z = 11.837, p < .05$ ; 95% CI of the difference = 0.395 to 0.440), Hispanic ( $z = 7.292, p < .05$ ; 95% CI of the difference = 0.078 to 0.135), Asian ( $z = 6.767, p < .05$ ; 95% CI of the difference = 0.106 to 0.191), Native American ( $z = 2.314, p < .05$ ; 95% CI of the difference = 0.017 to 0.201), and 'Other' adolescents ( $z = 4.052, p < .05$ ; 95% CI of the difference = 0.090 to 0.254). No other statistically significant differences were found by race/ethnicity on sexual behaviors within adolescent romantic relationships.

*Relationship Quality.* Table 12 presents various dimensions of social connectedness for adolescent romantic relationships. Seventy-four to eighty-five percent of adolescents in this sample indicated that they had met their partner's parents, had told others that they were a couple, and had gone out together with their partners in a group. No statistically significant differences were found by sex on

social connectedness for adolescent romantic relationships. Adolescent girls and boys were equally likely to report the above dimensions of social connectedness.

Older adolescents were significantly more likely than younger adolescents to report meeting their partner's parents and going out together with their partners in a group. Adolescents age 18 years were significantly more likely to meet their partner's parents go out together with their partners in a group than adolescents age 16 years ( $z = 4.226, p < .05$ ; 95% CI of the difference = 0.034 to 0.081), 15 years ( $z = 6.955, p < .05$ ; 95% CI of the difference = 0.069 to 0.119), 14 years ( $z = 10.656, p < .05$ ; 95% CI of the difference = 0.130 to 0.19), 13 years ( $z = 14.336, p < .05$ ; 95% CI of the difference = 0.216 to 0.291), and 12 years ( $z = 4.283, p < .05$ ; 95% CI of the difference = 0.151 to 0.312).

Adolescents age 18 years were also significantly more go out together with their partners in a group than adolescents age 16 years ( $z = 3.715, p < .05$ ; 95% CI of the difference = 0.021 to 0.069), 15 years ( $z = 5.215, p < .05$ ; 95% CI of the difference = 0.042 to 0.093), 14 years ( $z = 7.05, p < .05$ ; 95% CI of the difference = 0.074 to 0.133), 13 years ( $z = 7.624, p < .05$ ; 95% CI of the difference = 0.096 to 0.168), and 12 years ( $z = 6.833, p < .05$ ; 95% CI of the difference = 0.073 to 0.230).

Adolescents age 17 years were significantly more likely to meet their partner's parents than adolescents age 16 years ( $z = 4.226, p < .05$ ; 95% CI of the difference = 0.025 to 0.07), 15 years ( $z = 6.955, p < .05$ ; 95% CI of the difference = 0.060 to 0.109), 14 years ( $z = 10.656, p < .05$ ; 95% CI of the difference = 0.121 to 0.180), 13 years ( $z = 14.336, p < .05$ ; 95% CI of the difference = 0.207 to 0.280), and

12 years ( $z = 6.512, p < .05$ ; 95% CI of the difference = 0.141 to 0.302).

Adolescents age 17 years were also significantly more likely to out together with their partners in a group than adolescents age 16 years ( $z = 3.123, p < .05$ ; 95% CI of the difference = 0.013 to 0.059), 15 years ( $z = 4.735, p < .05$ ; 95% CI of the difference = 0.034 to 0.083), 14 years ( $z = 6.685, p < .05$ ; 95% CI of the difference = 0.066 to 0.123), 13 years ( $z = 7.286, p < .05$ ; 95% CI of the difference = 0.087 to 0.158), and 12 years ( $z = 3.995, p < .05$ ; 95% CI of the difference = 0.064 to 0.221).

Adolescents age 16 years were significantly more likely to meet their partner's parents than adolescents age 15 years ( $z = 2.83, p < .05$ ; 95% CI of the difference = 0.011 to 0.062), 14 years ( $z = 6.849, p < .05$ ; 95% CI of the difference = 0.072 to 0.133), 13 years ( $z = 10.874, p < .05$ ; 95% CI of the difference = 0.158 to 0.233), and 12 years ( $z = 4.723, p < .05$ ; 95% CI of the difference = 0.093 to 0.255). Adolescents age 16 years were also significantly more likely to out together with their partners in a group than adolescents age 15 years ( $z = 1.693, p < .05$ ; 95% CI of the difference = -0.003 to 0.048), 14 years ( $z = 3.922, p < .05$ ; 95% CI of the difference = 0.029 to 0.088), 13 years ( $z = 4.883, p < .05$ ; 95% CI of the difference = 0.051 to 0.123), and 12 years ( $z = 2.785, p < .05$ ; 95% CI of the difference = 0.028 to 0.185).

Adolescents age 15 years were significantly more likely to meet their partner's parents than adolescents age 14 years ( $z = 4.111, p < .05$ ; 95% CI of the difference = 0.034 to 0.098), 13 years ( $z = 8.34, p < .05$ ; 95% CI of the difference = 0.120 to 0.198), and 12 years ( $z = 3.523, p < .05$ ; 95% CI of the difference = 0.056 to 0.219). Adolescents age 15 years were also significantly more likely to out together with their partners in a group than adolescents age 14 years ( $z = 2.29, p < .05$ ; 95% CI

of the difference = 0.005 to 0.067), 13 years ( $z = 3.453, p < .05$ ; 95% CI of the difference = 0.027 to 0.102), and 12 years ( $z = 2.099, p < .05$ ; 95% CI of the difference = 0.005 to 0.164). Adolescents age 14 years were significantly more likely to meet their partner's parents than adolescents age 13 years ( $z = 4.375, p < .05$ ; 95% CI of the difference = 0.051 to 0.135), and 12 years ( $z = 1.645, p < .05$ ; 95% CI of the difference = -0.012 to 0.155). No other statistically significant differences were found by age on dimensions of social connectedness for romantic relationships.

Table 12 also shows racial/ethnic group variation with respect dimensions of social connectedness for romantic relationships. White adolescents were significantly more likely to meet their partner's parents than Black ( $z = 8.935, p < .05$ ; 95% CI of the difference = 0.066 to 0.106), Hispanic ( $z = 8.685, p < .05$ ; 95% CI of the difference = 0.070 to 0.115), Asian ( $z = 7.29, p < .05$ ; 95% CI of the difference = 0.089 to 0.166), Native American ( $z = 3.417, p < .05$ ; 95% CI of the difference = 0.050 to 0.226), and 'Other' adolescents ( $z = 2.045, p < .05$ ; 95% CI of the difference = 0.002 to 0.156).

White adolescents were also significantly more likely to go out together with their partners in a group than Black ( $z = 19.027, p < .05$ ; 95% CI of the difference = 0.148 to 0.190), Hispanic ( $z = 7.448, p < .05$ ; 95% CI of the difference = 0.038 to 0.082), and Native American adolescents ( $z = 2.182, p < .05$ ; 95% CI of the difference = -0.009 to 0.158). No other statistically significant differences were found by race/ethnicity on dimensions of social connectedness for romantic relationships.

### *Couple-Based Analyses*

*Age Discrepancies of Partners*'. Table 13 presents the age patterning of adolescent romantic couple members. A difference score was defined for each couple by subtracting the age of the female member of the couple from the age of the male member of the couple. A negative score indicates that the female was older than the male and a positive score indicates that the male was older than the female. A frequency distribution of these difference scores is presented for the total sample and for each couple type. Table 13 also presents the mean difference scores and 95% confidence intervals for these mean differences.

On average, males in the couples tended to be slightly older (by 0.35 years) than females in the couples. The age difference between couple members was statistically significant ( $p < 0.05$ ). In terms of couple type, males were significantly older than females in both the female asymmetric couples' ( $t(448) = 9.58, p < .001$ ) and the male asymmetric couples' ( $t(481) = 5.26, p < .001$ ), while partners in the symmetric couples' were not statistically significantly different from each other in age ( $t(320) = 0.78, p = .779$ ). Interaction contrasts revealed that the age differences between each couple type was statistically significant with female asymmetric couples showing a statistically significant larger age gap than male asymmetric couples who, in turn, showed a statistically significantly larger age gap than symmetric couples.

It should be noted that the mean age for both females and males tended to be higher in symmetric couples than in asymmetric couples. The average age for female

partners in symmetric couples' was 16.3 years, which was statistically significantly higher than the average age of females in female asymmetric couples' (15.4, 95% CI of the difference = 0.66 to 1.11,  $t(768) = 7.67, p < .001$ ) as well as male asymmetric couples' (15.5, 95% CI of the difference = 0.56 to 1.01,  $t(801) = 6.94, p < .001$ ).

This same pattern was observed for males across the couple types. That is, the average age of 16.3 years for male partners in symmetric couples' was statistically significantly higher than the average age of males in female asymmetric couples' (16.1, 95% CI of the difference = 0.03 to 0.49,  $t(768) = 2.20, p < .05$ ) and for male asymmetric couples' (15.8, 95% CI of the difference = 0.28 to 0.73,  $t(801) = 4.34, p < .001$ ). Thus, in addition to being more similar in age, symmetric couples were also older than asymmetric couple members.

*Extent of Sexual Activity as a Function of Couple Type.* For all couples (symmetrical, female asymmetrical, and male asymmetrical), 39% of the couples' reported that they had engaged in sexual intercourse. Twenty-seven percent of the female asymmetric couples', 34% of the male asymmetric couples', and 54% of the symmetric couples' reported engaging in sexual intercourse. The percentage for the symmetric couples' was significantly higher than both the female asymmetric couples' ( $z = 7.52, p < .001$ , 95% CI for difference is 20.04 to 34.16) and the male asymmetric couples' ( $z = 5.47, p < .001$ , 95% CI for difference is 12.83 to 27.17). Among asymmetric couples', male asymmetric couples' reported a higher proportion of engaging in sexual intercourse than the female asymmetric couples' ( $z = 2.93, p < .05$ , 95% CI for difference is 1.03 to 13.17).



The distribution of frequency of sexual intercourse with partner was highly skewed with a large portion of couples' reporting no sexual frequency and a few couples' reporting extremely high numbers of instances of sexual intercourse. Table 14 reports a mean score and a 20% trimmed mean (Wilcox, 1998) for each couple type. In both cases, symmetric couples' reported a higher frequency ( $p < .05$ ) of sexual intercourse than both the female and the male asymmetric couples'. Additionally, the male asymmetric couples' reported a higher frequency than the female asymmetric couples' ( $p < .001$ ).

Frequency of sexual intercourse also was calculated removing participants who had not engaged in sexual intercourse with their partners (i.e., the analysis was only conducted on sexually active couples). The mean number of acts of intercourse and the 20% trimmed means are presented in Table 15. For the traditional means, none of the means were statistically different from one another. For the trimmed means, both the female asymmetric couples' ( $t(176) = 22.41, p < .001$ ) and the symmetric couples' ( $t(234) = 33.36, p < .001$ ) reported higher mean frequencies than the male asymmetric couples'. The trimmed means for the female asymmetric and the symmetric couples' were not significantly different. Thus, focusing only on sexually active couples' yielded a slightly different pattern of results; symmetric couples' did not represent the couples' reporting the highest frequency of responses, but male asymmetric couples' still reported the lowest frequency.

In terms of consistent contraceptive use every time sexual intercourse occurred, the asymmetric couples', 61.7% ( $N = 58$ ) of the female nominated couples' and 72.4% ( $N = 84$ ) of the male nominated couples' reported using birth control

every time they engaged in sexual intercourse with their partners. In contrast, 52.2% ( $N = 35$ ) of the symmetric couples' reported using some form of birth control every time that they had sexual intercourse. The only statistically significant difference between couple types indicated that male asymmetric couples' reported more consistent birth control use than symmetric couples' ( $z = 2.59, p < .01, 95\%$  CI of the difference = 4.89 to 35.51).

*Level of Agreement on Reports of Couple Sexual Behavior.* For non-reciprocated nominations (male and female asymmetrical couples), a couple's measure of sexual activity was obtained by using the report of couple behavior from the individual who nominated the (non-reciprocating) partner. For partners who reciprocated nominations (symmetrical couples), both were independently asked if the couple had engaged in sexual intercourse, how often they had done so, and whether they had consistently used birth control. The following section reports analyses on the level of agreement on reports of couple sexual behavior for only the symmetrical couples because questions about couple sexual behavior for the asymmetrical couples were based one informant, the individual who nominated the romantic partner.

*Had Sexual intercourse with Partner.* Forty-four percent of the female couple members reported having had sexual intercourse with their male partner and 44% of the male couple members reported having had sexual intercourse with their female partner. Further analyses, however, showed that 32% of the couples agreed that they had engaged in sexual intercourse, 46% agreed that they did not have sexual intercourse, and 22% of the couples disagreed about whether or not they had engaged

in sexual intercourse. For those couples who made discrepant responses, 50% were the result of males claiming intercourse had occurred when the female did not; and 50% were attributed to females claiming intercourse had occurred when the male did not. Thus, there did not appear to be a self-report bias by gender: males and females were equally likely to make both types of disagreement.

Given both males and females were equally likely to make both types of disagreement additional analyses were performed to explore possible explanations for couple disagreement. One possible explanation for couple disagreement is the timing of each interview. Each partner was interviewed at a different point in time and it is possible that the first act of sexual intercourse for the couple occurred in-between the two partners' interviews. In this case, the first partner interviewed would respond that they had not had sexual intercourse and the second partner interviewed would respond that they had had sexual intercourse and both could be correct given that sexual intercourse occurred after the interview of the first couple member. To explore this possibility, discrepant responses were categorized to reflect the number of cases in which the interview of the partner claiming "no intercourse" occurred before the interview of the partner claiming intercourse. The analysis showed that almost half of the inconsistent responses (48%) fit such conditions and hence, may not truly be inconsistent in character.

Another possible explanation for couple disagreement was that the wording of the item was not specific. It is possible that when the respondents read the phrase "we had sexual intercourse," they interpreted this to mean different forms of sexual experience (e.g., oral sex) other than that intended (vaginal sexual intercourse). If

this were the case, then one would expect couple disagreement to the extent that partners interpreted the question differently.

It is difficult to know exactly what the discrepancies in reports imply other than random measurement error for the 11% of the sample where the time interval between interviews cannot explain the disparity. As a result, for the couple-based analyses using had sexual intercourse, an algorithm was adopted such that if one of the couple members claimed that intercourse occurred, then the couple was said to have engaged in sexual intercourse.

*Frequency of Sexual intercourse with Partner.* To examine the level of agreement on reports of couple frequency of sex, the female couple member's reports of sexual frequency was correlated with the male couple members' reports of sexual frequency ( $r = 0.346$ ;  $p < 0.001$ ). Additionally, female couple members' reports of sexual frequency were regressed onto the male couple members' reports of sexual frequency. If the two reports are comparable, one should observe an intercept of zero and a slope of 1. The resulting intercept was 9.48 (95% CI = 2.472 to 16.488) and the slope was .270 (95% CI = .181 to .359). The intercept differed significantly from 0 and the slope differed significantly from 1. When the male couple members' reports was regressed onto the female couple members' reports, the intercept was 11.15 (95% CI = 1.67 to 20.63) and the slope was .49 (95% CI = .329 to .651).

Outliers were detected within couple reports of frequency of sexual intercourse because a few partners reported an unusually large number of instances of sexual intercourse. An outlier robust index of correlation between the male and

female couple members' reports was calculated called the percentage bend correlation (Wilcox, 1997). The percentage bend correlation between female and male couple members' was 0.546 (95% CI = .446 to .628,  $p < .001$ ), which was higher than the outlier sensitive Pearson index. Because of the high frequency of zero responses (i.e., responses which corresponded to a report of no sexual activity), robust regression analyses were not performed. Instead, the correspondence of the female and male couple members' reports of sexual frequency was examined only among sexually active couples.

Couples were selected for whom at least one member reported a non-zero frequency of sexual activity. The corresponding Pearson correlation value was .314 ( $p < .01$ ). Robust regression analyses were then performed in which the female couple members' reports of sexual activity was regressed onto the male couple members' reports using M estimator regression methodology with Schweppe weights and a value of  $K = 0.10$  in the Huber function (Wilcox, 1997, p. 221). Confidence intervals for the robust procedures were estimated using the bootstrap method described in Wilcox (1997, p.223). The intercept was 5.91 (95% CI = 0.07 to 22.64) and the slope was 0.27 (95% CI = 0.02 to 1.01). When the male reports were regressed onto the female reports, the intercept was 7.22 (95% CI = 0.93 to 20.68) and the slope was 0.45 (95% CI = 0.25 to 0.94).

To further describe the consistency of responses of the frequency of sexual intercourse between the two partners, a variable was computed by subtracting the female couple members' reports of sexual frequency from the male couple members' reports. Positive scores reflect the male couple members' reporting higher frequency

in comparison to the female couple members' and negative scores reflected the female couple members' reporting higher frequency than the male couple members'. Analyses revealed that 58.8% of the symmetrically nominated couples' agreed on the exact number of times they had sexual intercourse and that 76.9% were within five instances of sexual intercourse of each other. The mean difference score was 3.81 (95% CI = -13.12 to 20.74) indicating that males reported a higher frequency of sexual intercourse. For the couple-based analyses using frequency of sexual intercourse, the average of the male couple members and female couple members' reports were used to form a single couple index of frequency of sexual intercourse for the symmetrically nominated couples'.

*Consistent use of Birth Control Every time Sexual Intercourse Occurred.*

Among couples' who reported engaging in sexual intercourse, 52% ( $N = 35$ ) agreed that they had always used some method of birth control, 13% ( $N = 9$ ) agreed that they had not always used some form of birth control, and 34% ( $N = 23$ ) disagreed on the consistency of birth control use. As before, a possible explanation of this discrepancy is that during the time interval between the interviews of each partner, an act of unprotected sexual intercourse occurred. In this case, the person who was interviewed first would say that the couple had always used birth control and the second person interviewed would say that the couple had not always used birth control. Thirty percent of the disagreements could have reflected such a scenario.

A second possible explanation for the disparity is that the female partner may have been using birth control methods that the male was unaware of (e.g., birth control pill). If this were the case, then one would expect that the female partner

would be more likely to report consistent birth control use than the male partner. This was true for 35% of the couples reporting disparities. Thus, about two thirds of the disagreements could potentially be attributed to interview timing or lack of awareness of the use of birth control on the part of the male. However, it is not possible to know the actual reason for the discrepancy. For the couple-based analyses using consistent use of birth control every time sexual intercourse occurred, a couple was scored as an inconsistent user of birth control if either of the couple members' claimed less than perfect consistency in use.

*SEM Analyses on Risk and Protective Model for Predicting Sexual Risk-Promoting and Risk-Reducing Behavior in Adolescent Romantic Couples'*

Three separate SEM models were pursued, one focused on the occurrence of sexual intercourse in the relationship. The second focused on the frequency of sexual intercourse in the relationship. The third focused on consistent use of birth control every time sexual intercourse occurred in the relationship. Each set of analyses are discussed in turn.

*Had Sexual Intercourse with Partner.* A variant of the path model in Figure 1 was tested (see Figure 2), which differed from it in the following ways: (1) direct causal paths were included from both male and female couple members' perceived pubertal timing, (2) direct causal paths were included from male couple members' adolescent-maternal relationship satisfaction to the female couple members' depressive symptoms and from female couple members' adolescent-maternal relationship satisfaction to the male couple members' depressive symptoms, and (3)

chronological age, type of couple (symmetrical, female asymmetrical, male asymmetrical), race/ethnicity, mother education level, father education level, and adolescent social desirability were included as covariates for all endogenous variables. These additions were made based on a poor model fit for the initial model, coupled with the evaluation of modification indices. The overall fit of the model was good. The chi-square for model fit was significant (chi square = 23.64,  $df = 12$ ,  $p < 0.023$ ) and all of the traditional indices of overall fit were satisfactory (CFI = 0.99 RMSEA =  $< 0.03$ ; close fit test =  $p < 0.99$ ). In addition, more focused fit tests all suggested good fit.

Table 16 presents the key path coefficients. Female couple members' actual pubertal timing was predictive of female couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation was associated with perceptions that one's pubertal development was earlier than one's peers. Male couple members' actual pubertal timing was predictive of male couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation was associated with perceptions that one's pubertal development was earlier than one's peers. Male couple members' actual pubertal timing was predictive of male couple members' depressive symptoms such that more advanced levels of pubertal maturation were associated with lower levels of depression.

Male couple members' relationship satisfaction with their mothers was predictive of male couple members' depressive symptoms and female couple members' depressive symptoms. The more satisfied male couple members were with their relationship with their mothers, the lower the depressive symptoms was for the



male couple members and their partners. Female couple members' relationship satisfaction with their mothers was predictive of female couple members' depressive symptoms. The more satisfied female couple members were with their relationship with their mothers, the lower their depressive symptoms.

Female couple members' perceived pubertal timing was predictive of having sexual intercourse; such that adolescent couples' with female couple members who perceived their pubertal development as earlier than their peers were more likely to report having sexual intercourse. Male couple members' actual pubertal timing was predictive of having sexual intercourse; such adolescent couples' with male couple members' who self-reported more advanced levels of pubertal maturation were less likely to report having sexual intercourse. One effect that approached significance involved male couple members' perceived pubertal timing. Adolescent couples' with male couple members' who perceived their pubertal development as earlier than their peers were more likely to report having sexual intercourse. The total effects for each of the study variables in the model are presented in Table 17.

*Frequency of Sexual Intercourse with Partners'*. The same SEM model described above was tested but using the outcome of frequency of sexual intercourse with partner. The overall fit of the model was good. The chi-square for model fit was significant (chi square = 23.64,  $df = 12$ ,  $p < 0.023$ ) and all of the traditional indices of overall fit were satisfactory (CFI = 0.99 RMSEA =  $< 0.03$ ; close fit test =  $p < 0.99$ ). In addition, more focused fit tests all suggested good fit.

Table 18 present the key path coefficients. Female couple members' actual pubertal timing was predictive of female couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation was associated with perceptions that one's pubertal development was earlier than one's peers. Male couple members' actual pubertal timing was predictive of male couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation were associated with perceptions that one's pubertal development was earlier than one's peers.

Male couple members' actual pubertal timing was predictive of male couple members' depressive symptoms such that more advanced levels of pubertal maturation were associated with lower levels of depression. Male couple members' perceived pubertal timing was predictive of frequency of sexual intercourse; such that adolescent couples' with male couple members' who perceived their pubertal development as earlier than their peers were more likely to have sexual intercourse more frequently. Conversely, male couple members' actual pubertal timing was predictive of frequency of sexual intercourse; such that adolescent couples' with male couple members' who self-reported more advanced levels of pubertal maturation reported having sexual intercourse less frequently.

Female couple members' relationship satisfaction with their mothers was predictive of frequency of sexual intercourse. The more satisfied female couple members were with their relationship with their mothers, the less frequent adolescent couples' had sexual intercourse. Female couple members' relationship satisfaction with their mothers was predictive of female couple members' depressive symptoms.

The more satisfied female couple members' were with their relationship with their mothers, the lower their depressive symptoms. Male couple members' relationship satisfaction with their mothers was predictive of male couple members' depressive symptoms and female couple members' depressive symptoms. The more satisfied male couple members were with their relationship with their mothers, the lower the depressive symptoms was for the male couple members and the female couple members. The total effects for each of the study variables in the model are presented in Table 19.

*Consistent use of Birth Control Every time Sexual Intercourse Occurred.* The same SEM model described above was tested but using the outcome of consistent use of birth control every time sexual intercourse occurred. The overall fit of the model was good. The chi-square for model fit was significant (chi square = 23.60,  $df = 12$ ,  $p < 0.023$ ) and all of the traditional indices of overall fit were satisfactory (CFI = 0.98 RMSEA =  $< 0.06$ ; close fit test =  $p < 0.28$ ). In addition, more focused fit tests all suggested good fit.

Table 20 present the key path coefficients. Female couple members' actual pubertal timing was predictive of female couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation was associated with perceptions that one's pubertal development was earlier than one's peers. Male couple members' actual pubertal timing was predictive of male couple members' perceived pubertal timing; such that more advanced levels of pubertal maturation was associated with perceptions that one's pubertal development was earlier than one's peers.

Female couple members' perceived pubertal timing was predictive of consistent use of birth control every time sexual intercourse occurred; such that adolescent couples' with female couple members' who perceived their pubertal development as earlier than their peers were more likely to use birth control every time sexual intercourse occurred. Male couple members' relationship satisfaction with their mothers was predictive of male couple members' depressive symptoms and female couple members' depressive symptoms. The more satisfied male couple members were with their relationship with their mothers, the lower the depressive symptoms was for the male couple members' and the female couple members. The total effects for each of the study variables in the model are presented in Table 21.

## CHAPTER V

### DISCUSSION

The current study examined the interplay of four systems of variables believed to be primary contributors to sexual behavior in adolescent romantic couples (i.e., adolescent depressive symptoms, pubertal development, perceived pubertal timing relative to one's peers, and adolescent-maternal relationship satisfaction) in a sample of adolescents aged 12 to 18 years. Assessments of these variables were made by each couple member separately and then these variables were used to test a risk and protective model for predicting sexual risk-promoting and risk-reducing behaviors in adolescent romantic couples.

In addition, the current study examined several dimensions of adolescent romantic experiences (i.e. romantic involvement, partner selection, relationship content, and relationship quality). This aspect of the dissertation answered several questions such as (1) What percent of adolescents experience a romantic relationship? (2) How homogenous are the romantic relationships of adolescents? (3) How stable are romantic relationships? (4) What kinds of behaviors typically occur within these relationships? (5) How connected are these relationships to peer and parental relationships? (5) How does romantic relationship behavior vary by the demographic characteristics of adolescents?

Overall, results demonstrated that romantic relationships are part of most adolescents' lives and that adolescents' experiences with these relationships differ markedly by age, sex, and race/ethnicity. Further, each respective couple member's

pubertal development, perceived pubertal timing, and maternal relationship satisfaction were usefulness in predicting sexual risk-promoting and risk-reducing behaviors in adolescent romantic couples. Findings in the current study represent an initial step toward evaluating explanatory models of adolescent couple sexual behavior.

### *Dimensions of Adolescent Romantic Experiences*

Consistent with past research (Carver et al., 2003), results of the current study demonstrated that most adolescents between the ages of 12 to 18 years (56%) have engaged in a romantic relationship. Relationship prevalence was significantly higher in adolescent girls compared to adolescent boys. Further, the percent of romantic involvement increased monotonically with age, with adolescent girls' age 15 and older reporting significantly more romantic involvement than similarly aged adolescent boys. The above findings may, in part, reflect sex differences in desire to establish romantic relationships; past research have demonstrated that adolescent girls, compared to adolescent boys, report greater interests in establishing romantic relationships (Darling et al., 1999) and are more preoccupied with romantic relationships (Larson et al., 1999).

On average, romantically involved adolescents ages 12-15 years were slightly younger than their nominated partners; with adolescent boys reporting younger nominated partners and adolescent girls reporting older nominated partners. This finding is consistent with past research (Carver et al., 2003; Kendrick, Gabrielidis, Keefe, & Cornelius, 1996). The majority of adolescents in this study nominated

romantic partners of the same race/ethnicity; this result may reflect a tendency for adolescents to attend schools and have peer relationships that are racially segregated. Past research using Add Health data demonstrated that adolescents were more likely to have romantic partners' of a different race/ethnicity if they attend schools with fewer students of the same race/ethnicity (Carver et al., 2003).

Nearly half of the adolescents in this study met their romantic partners either at school or through peer relationships. This finding is consistent with developmental theory on the structure of peer relationships. Dunphy (1963) proposed that adolescents progress through a five-stage sequence of structural changes in peer relationships that involves transitions from small same-sex groups to associations with mixed-sex groups, to the formation of larger heterosexual groups, which provides a context for dating, and finally, crowd dissolution in favor of dyadic romantic relationships.

Results further demonstrated that the duration of romantic relationships between adolescents is not transient, but rather lasts almost a year. Most adolescents in this sample reported that their relationships were characterized by a great deal of emotional involvement, including expressions of love, thinking of themselves as a couple, going out together alone, and exchanging gifts. Most adolescents also reported meeting their partners parents and going out together with their partners' in a group.

As expected, entry into romantic relationships precedes the initiation of sexual behavior for most adolescents. Results in the current study demonstrated that

adolescents engaged in more “light” sexual activities such as holding hands, kissing each other, and touching each other under clothing than “heavy” sexual activities such as touching each other’s genitals and sexual intercourse. Older adolescents reported engaging in more “heavy” sexual activities than younger adolescents.

It is possible that younger adolescents may feel that they are not ready, or mature enough, to engage in more serious and intimate forms of sexuality. Young adolescents may also not have the opportunities for heavier sexual activities to occur since their dating activities are largely group-based (e.g., Connolly & Johnson, 1996; Connolly et al., 2004; Feiring, 1999). Given there is a progression from lighter sexual activities to heavier sexual activities, results of this study highlight the significant number of young adolescents who are engaging in lighter sexual activities in all likelihood of making the transition to heavier activities at some point later in adolescence.

*Summary.* The results on dimensions of romantic experiences may be of use to several different audiences, including program developers, individuals working directly with adolescents, and researchers seeking to build upon the existing research and theory in this area. It is possible that the patterns of romantic involvement observed in this study varied according to developmental shifts in social and personal needs (Bukowski, Sippola, & Newcomb, 2000). Past research suggests that some features, such as physical attractiveness, are important in early adolescence, whereas others, such as intimacy and commitment, tend to gain significance in late adolescence. As the nature of adolescent relationships’ change, the allure of romantic



and sexual involvement could wax and wane based on developmental shifts in social and personal needs of the adolescent.

Alternatively, other mechanisms that produced these developmental differences may stem from factors such as expectancies about the anticipated physical pleasure of sex, injunctive norms of peers, or positive emotions associated with sex (Guilamo-Ramos, Jaccard, Dittus, Gonzalez, & Bouris, 2008). It is also important to understand more about the previous history and experience of adolescents who engage in romantic relationships during early adolescence (ages 11-14). For example, it is possible that adolescents already at risk for poor developmental outcomes may seek out romantic relationships to increase their belonging and status with peers. These adolescents then become involved in relationships that further contribute to an impaired sense of self. More research is needed to understand the observed developmental differences on these dimensions of adolescent romantic experiences. Differentiating between normal and abnormal adaptive learning experiences of adolescent romance is essential for future research.

### *Couple-Based Analyses*

There were several striking results from the couple-based analyses that potentially have implications for researchers seeking to build upon the existing research and theory on adolescent romantic relationships. The first result was the significant age difference by couple type. In this study, the average age for female partners in symmetric couples was 16.3 years, which was significantly higher than the average age of females in female asymmetric couples (15.4 years) and in male

asymmetric couples (15.5 years). This same pattern was also observed for males across the couple types. The average age of 16.3 years for male partners in symmetric couples was significantly higher than the average age of males in female asymmetric couples (16.1 years) and for male asymmetric couples (15.8 years). Thus, symmetric couples were more similar in age and older than asymmetric couple members.

The above finding is consistent with a developmental model for adolescent romantic involvement (Connolly & Goldberg, 1999) which posits that the process of learning how to engage in romantic and sexual relations unfolds over the course of adolescence. From this perspective the finding that adolescents' involved in non-reciprocated relationships are younger makes sense because they are struggling to master a new and particularly difficult developmental challenge (Cantor & Sanderson, 1998; Zimmer-Gembeck, Siebenbruner, & Collins, 2001). For example, younger adolescents may be involved in non-reciprocated relationships because they fail to appreciate the emotional give-and-take typical of romantic relationships and therefore perceive themselves as having boyfriends and girlfriends based on casual behaviors (e.g., sitting together at lunch).

Alternatively, younger adolescents may misperceive a peer's friendliness as romantic interest or may be confused about an opposite-sex friendship that includes flirting or physical contact. Research is scant on the meaning of romantic relationships among adolescents. The existing evidence indicates that during early adolescence, some adolescents hold false beliefs regarding their romantic involvement (Carver & Udry, 1997; Neeman Hubbard, & Masten, 1995; Shulman &

Scharf, 2000). More research is needed using both reciprocated and non-reciprocated adolescent relationship dyads to explore this possibility further.

A second striking result was the difference between couple type on reports of consistent birth control use every time sexual intercourse occurred. In this study, 72% of the male asymmetric couples' reported using some form of birth control every time they had sexual intercourse compared to the female asymmetric couples (61%) and the symmetric couples (52%). It is possible that adolescents' involved in non-reciprocated relationships are not encumbered with the insecurities about the future that make it romantically risky to insist on sexually non-risky practices. In this context, adolescents' involved in non-reciprocated relationships are more likely to use contraceptives than adolescents' involved in reciprocated relationships.

Past studies have considered non-reciprocated adolescent romantic relationships to be more problematic than reciprocated relationships because such relations are not believed to include elements of stability or commitment (e.g., Ford, Woosung, & Lepkowski, 2001; Manning et al., 2000; Norris, Ford, Shyr, & Schork, 1996; Ott, Adler, Millsteind, Tschann, & Ellen, 2002). However, findings from this study suggest that these relationships are more likely to include sexual risk-reducing behavior. Thus, adolescents involved in reciprocated relationships may be at increased risk for unintended pregnancy and STDs. Future research needs to explore this in more depth.

*SEM Analyses on Risk and Protective Model for Predicting Sexual Risk-Promoting and Risk-Reducing Behavior in Adolescent Romantic Couples'*

At the path level, the SEM analyses supported many of the hypothesized relations between each couple members' depressive symptoms, pubertal development, perceived pubertal timing relative to one's peers, adolescent-maternal relationship satisfaction, and couple sexual activity. First, both male and female couple members' who reported more advanced levels of pubertal maturation also perceived their pubertal development to be earlier than their same sex/same age peers (Hypothesis 1). Second, the assumption that both male and female couple members' actual and perceived pubertal development would directly influence each respective member's depressive symptoms was partially supported. Male couple members' who reported more advanced levels of pubertal development reported lower levels of depressive symptoms (Hypothesis 4). Both male and female couple members' perceived pubertal development was *not* related to each respective members' depressive symptoms and female couple members' actual pubertal development was *not* related to female couple members' depressive symptoms (Hypothesis 5).

Third, the assumption that both male and female couple members' actual and perceived pubertal development would directly influence couple sexual behaviors independent of the mediator (i.e., depressive symptoms) was partially supported. Adolescent romantic couples' with male couple members' who self-reported more advanced levels of pubertal maturation were less likely to have sexual intercourse and had sexual intercourse less frequently (Hypothesis 2). Also, adolescent romantic couples' with male couple members who perceived their pubertal development as

earlier than their peers also had sexual intercourse more frequently (Hypothesis 3). Moreover, adolescent romantic couples' with female couple members' who perceived their pubertal development as earlier than their peers were more likely to have sexual intercourse and consistently used birth control every time sexual intercourse occurred (Hypothesis 3). Female couple members' actual pubertal development was *not* related to couple sexual behavior.

Further, each respective member's depressive symptoms did *not* mediate the relations between both male and female couple members' actual and perceived pubertal development and couple sexual behavior (Hypothesis 6). There was *not* a direct effect of each respective member's depressive symptoms on couple sexual behavior (i.e., had sexual intercourse, frequency of sexual intercourse, consistent use of birth control every time sexual intercourse occurred).

Fourth, as predicted, both male and female couple members' relationship satisfaction with their mothers directly influenced each respective member's depressive symptoms. Female couple members' who reported being more satisfied with their relationship with their mothers reported lower depressive symptoms (Hypothesis 8). Interestingly, male couple members' who reported being more satisfied with their relationship with their mothers reported lower depressive symptoms and their partners' also reported lower depressive symptoms (Hypothesis 8). Female couple members' maternal relationship satisfaction was *not* related to male couple member's depressive symptoms, however.

Lastly, the assumption that both male and female couple members' relationship satisfaction with their mothers would directly influence couple sexual behaviors was partially supported. Adolescent romantic couples' with female couple members' who reported being more satisfied with their relationship with their mothers had sexual intercourse less frequently (Hypothesis 7). Male couple members' maternal relationship satisfaction was *not* related to frequency of sexual intercourse and both male and female couple members' maternal relationship satisfaction was *not* related to having sexual intercourse and consistency of birth control. Further, each respective member's depressive symptoms did *not* mediate the relations between both male and female couple members' maternal relationship satisfaction and couple sexual behavior (Hypothesis 9).

*Actual Pubertal Development.* The level of pubertal development influences the sexual behavior of adolescent couples', but that the primary influence on such behavior is the level of pubertal development on the part of the male member of the dyad as opposed to the female member of the dyad. Adolescent romantic couples' engaged in sexual risk-reducing behavior when male couple members' self-reported more advanced levels of pubertal development. This finding is consistent with past research that suggests romantic and sexual involvement during adolescence is governed by age-graded social expectations rather than by physical changes (e.g., Dornbusch, Carlsmith, Gross, Martin, Jennings, Rosenberg et al., 1981; Garguilo, Attie, Brooks-Gunn, & Warren, 1987).

It is possible that early pubertal timing does not allow male couple members sufficient time to complete prior developmental tasks before the onset of puberty and

new developmental pressures (i.e., moving into older mixed-sex peer groups and entering romantic relationships). One characteristic of romantic relationships, which has consistently varied by gender, is an individual's capacity for intimacy (Maccoby, 1995; Maccoby & Jacklin, 1987). Previous research suggests that adolescent girls are much more comfortable and adept with intimacy than adolescent boys (Fischer, 1981). As couples embark on the first stages of intimacy, early developing boys may seek to prolong the early stages and delay intercourse.

It is difficult to interpret the absence of a relation between female couple members' actual pubertal development and couple sexual behavior, particular given past research has demonstrated such a link (e.g., Mezzich et al., 1997). One reason this relation was not evident in the current study may, in part, be a result of the way in which pubertal development was measured. In the current study, multiple pubertal indicators were combined into a single index of pubertal development. It is possible that different types of pubertal indicators may have different effects on adolescent adjustment problems. For example, development of breasts is distinct from menarche because the former is a visible event likely to draw public reactions. Menarche, in contrast, is a private event and may not be a factor in girls' social interactions. Past research has supported this finding in girls (Carter, Jaccard, Silverman, & Pina, 2008), but no study has examined the effects of different indicators of pubertal development on adjustment problems in adolescent boys.

Another reason this relation was not evident in this study may, in part, reflect our unit of analysis. Namely, the relation between pubertal development and couple sexual risk behavior was examined in the context of an adolescent romantic

relationship. Past research that has demonstrated a pubertal-sexual risk behavior link using samples of individual adolescents, primarily girls (e.g., Mezzich et al., 1997). Given sexual behavior is the result of actions of a dyad (e.g., a male and female engaging in protected or unprotected sex), more research is needed in which pubertal measures from each couple member are used to predict and understand the sexual activity of adolescents.

*Perceived Pubertal Development.* Perceived pubertal timing influences the sexual behavior of adolescent couples', but the primary influence on such behavior is on the part of both members of the dyad. That is, both male and female partner's perceived pubertal timing was independent determinates of couple sexual behavior. Adolescent romantic couples' engaged in sexual risk-reducing behavior (i.e., consistent use of birth control) when female couple members' perceived their pubertal development to be early relative to their peers. Conversely, adolescent romantic couples' engaged in sexual risk-promoting behavior (i.e., had sexual intercourse) when female couple members' perceived their pubertal development to be early relative to his peers. Moreover, adolescent romantic couples' engaged in sexual risk-promoting behavior (i.e., had sexual intercourse more frequently) when male couple members' perceived their pubertal development to be early relative to his peers.

As noted in the literature review, the present study focused on one facet of the peer context that is directly tied to pubertal development: perceived pubertal timing. This facet of the peer context affords the opportunity to index a more psychologically textured aspect of pubertal development (Graber et al., 1997). That is, perceiving



oneself to be experiencing pubertal changes in temporal isolation from one's peer group may be partly based on how well the adolescent's pubertal timing aligns with the ideals of their socio-cultural context. Hence, perceived pubertal timing may reflect a different process than direct inquiry regarding the onset of puberty (e.g., age at menarche); possibly at the individual or social rather than biological level.

As a result, it is not surprising that each couple member's perceived pubertal timing predicted couple sexual behavior. The current study's findings vary from past research because the link between early pubertal timing and sexual behavior was established using reports of both actual pubertal timing and perceived pubertal timing. Further, the current study's results vary from past research findings because it examined this link on couple sexual behavior not the sexual behavior of one couple member.

The initiation and development of romantic relationships usually takes place in a context of existing peer relationships (Zimmer-Gembeck, 2002). It is possible that other individuals (e.g., peers, parents, and romantic partners) may view female couple members' as older and more socially and cognitively advanced than the girls, in fact, are because of the readily observable physical changes that occur during puberty (Caspi, 1995; Caspi & Moffitt, 1991). As a result, female and male couple members' may be exposed to older peers, and, subsequently potential romantic partners, who have more romantic and sexual experience. Perceived early development may therefore change the social context of couple members', in part, from their tendency to match their behavior to that of their older peers (Brooks-Gunn

& Paikoff, 1997; Caspi & Moffitt, 1991; Ge et al., 1996, 2001; Graber et al., 1997; Graber, Brooks-Gunn, & Galen, 1998; Weichold & Silbereisen, 2001).

Interestingly, adolescent romantic couples' with female couple members' who perceive their pubertal development to be early relative to their peers were engaging in sexual risk-reducing behavior (i.e., consistent use of birth control). This finding is contrary from past research that demonstrated younger adolescents, particularly girls, find it difficult to negotiate safer-sex practices with their partners because of lack of empowerment and access to financial resources (e.g., Rassjo, Mirembe, & Darj, 2006).

It is possible that adolescent girls who perceive their pubertal development to be early are affiliating with older peers who support condom use. Past research has found that perception by adolescents that their peers support condom use is associated with more consistent condom use (Boyer, Shafer, Wibblesman, Seeberg, Teitle, & Lovell, 2000; DiClemente, 1991). Future research needs to explore this in more depth.

*Adolescent Depression.* Surprisingly, each respective couple member's depressive symptoms did not mediate the relations between both male and female couple members' actual and perceived pubertal development and couple sexual behavior. Further, there was no direct effect of each respective member's depressive symptoms on couple sexual behavior (i.e., had sexual intercourse, frequency of sexual intercourse, consistent use of birth control every time sexual intercourse occurred). The absence of a relation between both male and female couple member's depressive

symptoms and couple sexual behavior may, in part, be a result of using depression as an indicator of psychological well-being; given it overstates differences between males and females. Rates of depression among girls are double those of boys (Lewinsohn et al, 1993; Nolen-Hoeksema & Girgus, 1994). Past research that has demonstrated links between sexual behavior and adolescent depression largely included female samples. This limits conclusions about the strength and nature of the association between adolescent sexual behavior and depressive symptoms for boys. Exploration of gender differences is thus an important avenue for future research.

Another reason this relation was not evident in this study may, in part, reflect the lack of information on possible co-occurring problems. It is possible that different types of co-occurring problems may have implications for different types of couple sexual behavior. For instance, adolescents with co-occurring externalizing problems may be romantically impaired in different ways than those with co-occurring anxiety or avoidant tendencies. More research is needed to fully investigate this finding.

Although depression was not related to couple sexual behavior, results from this study did demonstrate that adolescent couples' with a male couple member who reported more advanced levels of pubertal development also reported lower levels of depressive symptoms. This finding is consistent with past research that demonstrated more positive consequences for psychosocial adjustment in adolescent boys who mature earlier than their peers than in adolescent boys who mature later (see Compain & Hayward, 2003). However, the extent to which this finding influences couple

sexual activity is unclear given no direct effect was found between each respective member's depressive symptoms and couple sexually activity.

*Adolescent-Maternal Relationship Satisfaction.* Satisfaction with the adolescent-maternal relationship influences the sexual behavior of adolescent couples', but that the primary influence on such behavior is the level of satisfaction on the part of the female member of the dyad as opposed to the male member of the dyad. Adolescent romantic couples' engaged sexual risk-reducing behavior (i.e., had sexual intercourse less frequently) when female couple members' were satisfied with their relationship with their mothers'. This finding is contrary to past research that demonstrated that the quality of an adolescent's relationship with his or her mother, including how the adolescent perceives this relationship, is significantly associated with risky sexual behavior, not risk-reducing sexual behavior (see Kotchick et al., 2001, for a review).

The present study finding, however, supports the notion that the decision to engage in risk-promoting or risk-reducing sexual behavior occurs within existing systems of relationships including maternal-adolescent relationships. Understanding the entire maternal-adolescent relationship as romantic relationships develop will likely improve our understanding of couple sexual risk behavior. It is possible that mothers who talk to their adolescent girls about sex or contraceptive use have closer relationships with their daughters and may monitor their daughters' activities more closely than mothers who do not talk to their daughters about sex or contraceptive use. If this were true, the daughters' of mothers' who talk to them about sex and contraceptive use would spend relatively more time with their mothers' and less time

with their romantic partners than the daughters' of mothers' who do not talk to them about sex and contraceptive use. Past research has consistently demonstrated that maternal – communication is significantly related to adolescent sexual behavior (e.g., Dittus et al., 1999; Jaccard, Dodge, & Dittus, 2002; Miller et al., 2000; Rose, Koo, Bhasker, Anderson, White, & 2005). More research is needed to explore this possibility further.

Further, adolescent romantic couples with a female or male couple member who are satisfied with his/her relationship with his/her mother likely experience low levels of depressive symptoms. This finding is consistent with past research that demonstrated the association between romantic experiences and depressive symptoms is stronger for early-adolescent girls with emotionally unavailable parents (Doyle, Brendgen, Markiewicz, & Kamkar, 2003). Thus, when parents are unavailable to help adolescents regulate emotions and cope with the stress of romantic experiences, adolescents may fail to develop such skills and be more vulnerable to depressive symptoms.

Taken together, the finding that both male and female couple members' maternal relationship satisfaction was related to each respective member's depressive symptoms suggests that the effect of adolescent-maternal relationship satisfaction on couple sexual activity may be indirect, rather than or in addition to being direct. Although each respective member's depressive symptoms did not mediate the links between both male and female couple members' maternal relationship satisfaction and couple sexual activity, the above finding is important because adolescent-maternal relationship satisfaction may have an impact on couple sexual behavior by

influencing other correlates of couple sexual behavior such as depression. More research is needed to explore this finding further.

### *Limitations*

There are several limitations to this study that should be noted. First the omission of couples in which the partner was not enrolled in the same school is a design limitation that omits a significant type of couple. The absence of adolescents beyond school age is particularly troublesome because they are the romantic partners of many of the senior-level adolescent girls. The existence of such couples from adolescent girls' in this samples are recorded by the nominated romantic partner cannot interview them. It is possible that the particular characteristics of romantic partners who are not school age influence couple sexual behavior. As a result, some distortion of the results from their absence is warranted.

Second, the study relied primarily on self-report data measures to assess both male and female couple members' actual pubertal timing, perceived relative pubertal timing, depressive symptoms, and maternal relationship satisfaction. Although most studies in this area of research have used adolescent self-report data, past research in which pubertal timing was assessed demonstrated that the effects of pubertal timing on adolescent psychosocial adjustment vary depending upon who rates the adolescents' pubertal development (i.e., parent, adolescent, physician) (Dorn, Susman, & Ponirakis, 2003). Future studies should include an even broader source assessment approach than that used in this study.

Third, other factors not measured in this study could have accounted for variance when interacting with the other variables in the study. For example, Caspi and Moffitt (1991) proposed that prior problem behaviors in adolescent girls lead to greater psychosocial adjustment problems in early developing girls, not early pubertal timing per se. In addition, the study findings may differ as a function of acculturation and enculturation factors. Certainly, the discontinuity between cultural values in the family and those of the extra familial settings such as schools may provide challenges with implications for couple sexual activity.

Fourth, the present study was cross-sectional which offers no insight into the direction of the study effects. Future research could benefit from testing the alternative direction of the study effects. It is possible that couple sexual behavior may lead to depressive symptoms because adolescents are involved in romantic relationships. Thus, romantic partners' pre-relationship characteristics may predict changes in adolescents' functioning and subsequently, influence their decision to engage in risk-reducing or risk-promoting sexual behavior.

Lastly, estimating the duration of adolescent romantic relationships is challenging because many adolescents do not always know exactly when their relationships began, particularly if partners were friends before they were romantic partners, which is the case with this study sample. Because data analyses only included data on the relationship that was listed first, which was likely to be the most important and/or the longest relationship, it is possible that underreporting the frequency and duration of short-term relationships. Keep this bias in mind when interpreting the study findings.

### *Conclusion and Future Directions*

Adolescent romantic relationships have rarely been the focus of investigations of adolescent sexual behavior, despite the fact that romantic relationships are the context in which the majority of adolescents' sexual behavior occurs. This dissertation is the first study to examine both members of the adolescent couple and then used measures from each couple member to predict and understand the sexual activity of that couple (see Udry & Chantala, 2004, for an exception). Given the existing research on adolescent sexual behavior is methodologically limited and incomplete; the results of this study offer some justification for researchers to examine couple sexual activity beyond individual-based variables.

The model evaluated in this dissertation explicitly recognizes the potential importance of two types of normative influences in predicting sexual risk-promoting and risk-reducing behaviors in adolescent romantic couples: pubertal development (actual and perceived) and satisfaction with the adolescent-maternal relationship. Couple sexual behavior is largely influenced by their social and relational contexts. The study findings point to the need to move away from interventions that focus on changing individual behaviors and toward intervention strategies that also take into account adolescents' social and relational contexts.

Adolescent romantic couples' engaged sexual risk-reducing behavior when male couple members' self-reported more advanced levels of pubertal development, female couple members' perceived their pubertal development to be early relative to their peers, and female couple members' were satisfied with their relationship with



their mothers'. Conversely, adolescent romantic couples' engaged in sexual risk-promoting behavior when male and female couple members' perceived their pubertal development to be early relative to his peers.

The above findings strongly suggest that adolescent couples' are faced with a number of socializing factors (i.e., mothers, peers) that promote conflicting norms regarding sexual behavior. Research on adolescent sexuality may need to capture the social complexities of adolescents' lives better and to explore how multiple social factors simultaneously influence couple sexual activity. For example, factors such as exposure to media images of sexuality and pressure from a potential sex partner are likely to interact with peer norms and parental influence to influence couple sexual activity. Furthermore, parental guidance during adolescents' sexual development is critical in helping adolescents' successfully navigate the myriad of social influences that influence adolescent sexuality. Future research should continue to explore how parents can buffer social influences that promote risky sexual behavior among adolescent couples.

Further, the biosocial model (Smith et al., 1985; Udry, 1988) on adolescent sexual behavior appears to support the study findings. Biological factors such as physical maturation, and social factors related to maturation such as peer relationships may promote the onset and patterns of sexual behavior during adolescence. Extensions of this model emphasize development and biology within a context of social contagion—the spreading of ideas and activities within a social environment at times of transition—to explain adolescent sexual behavior (Rodgers & Rowe, 1993).

Although this dissertation's findings are promising, additional efforts to refine the tested model are needed. One possible way to refine the study model is to explore the moderating role personality or impersonal style. It is possible that adolescent couple members' with preoccupied style are needy and fear rejection, as such, likely to engage in risk-promoting sexual behaviors (Collins & Read, 1990). Certainly, other personality and interpersonal factors also likely come into play (e.g., neuroticism), as well as other types of individual differences. For example, it is possible that early developing adolescent girls may have poorer relationship competence, and as such, likely to engage in risk-promoting sexual behaviors. Shedding light on the moderating roles of personality or impersonal style may improve understanding of the relational contexts of couple sexual activity.

Another way to refine the study model is to explore the expectations and self-efficacy that adolescents have about sexual activity. Adolescents may decide to engage in sexual activity if they perceive it as leading to positive consequences and not leading to negative consequences. Further, adolescents who have positive beliefs or attitudes about condom use (e.g., that they do not reduce sexual pleasure), have been found to use condoms more often (Basen-Engquist & Parcel 1992; Norris & Ford 1998). Self-efficacy (i.e., a person's belief that they have a level of control over their motivations), beliefs, and behaviors have been found to influence adolescent communication about sex and condom use (Halpern-Felsher, Kropp, Boyer, Tschann, & Ellen, 2004). It would be important to understand the extent to which the expectations and self-efficacy of adolescents influence either risk-reducing or risk-promoting sexual activity in adolescent couples'.

The continued examination of this study model is needed to further determine the important ways in which social, emotional, and environmental pathways through biological variables such as perceived pubertal timing, relate to either sexual risk-promoting or risk-reducing behaviors in adolescent couples. The findings reported in this dissertation represent an initial step toward evaluating explanatory models of adolescent couple sexual behavior.

Table 1: Proportions for Socio-demographics of Male and Female Partners

	Female Couple Members	Male Couple Members
Race/Ethnicity		
White	57.4%	56.2%
Black	18.9%	21.2%
Hispanic	15.0%	14.5%
Asian	6.7%	5.8%
Native American	1.1%	1.2%
Other	0.8%	1.2%
Religion		
Protestant	56.1%	54.9%
Catholic	29.0%	27.0%
Jewish	0.7%	0.6%
Other	3.1%	3.9%
None reported	11.1%	13.7%

Note:  $n = 1,252$

Table 2: Proportions for Socio-demographics of the Parents of Male and Female Partners

	Female Couple Members	Male Couple Members
<b>Parent Education</b>		
Less Than High School	14.6%	15.4%
High School Degree	31.7%	29.6%
Trade School	8.9%	9.3%
Attended College	21.3%	20.8%
College Graduate	14.5%	15.1%
Professional College	8.9%	9.7%
<b>Parental Marital Status</b>		
Never Married	4.1%	5.6%
Married	75.2%	72.3%
Widowed	3.4%	3.6%
Divorced	12.6%	15.0%
Separated	4.6%	3.4%

Note:  $n = 1,252$

Table 3. Percent of Adolescents who had a Romantic Relationship in the last 18 months by Sex and Age at Interview

	<i>N</i>	Romantic Relationship in Last 18 Months	No Romantic Relationship in Last 18 Months
Total	20,088	55.6	44.4
Age at Interview, by Sex			
Females	10212	57.2	42.8
12 years	288	27.1	72.9
13 years	1179	31.9	68.1
14 years	1469	42.5	57.5
15 years	1854	55.4	44.6
16 years	2004	61.9	38.1
17 years	1937	71.6	28.4
18 years	1481	74.7	25.3
Males	9876	53.7	46.3
12 years	215	29.8	70.2
13 years	1041	36.8	63.2
14 years	1289	43.4	56.6
15 years	1753	49.2	50.8
16 years	2058	54.2	45.8
17 years	1967	64.4	35.6
18 years	1553	67.5	32.5

Table 4. Percent of Adolescents who had a Romantic Relationship in the last 18 months by Race/Ethnicity and Sex

	<i>N</i>	Romantic Relationship in Last 18 Months	No Romantic Relationship in Last 18 Months
<b>Race/Ethnicity</b>			
White	10640	58.3	41.7
Black	4457	51.6	48.4
Hispanic	3201	55.8	44.2
Asian	1355	43.5	56.5
Native American	203	57.6	42.4
Other	229	61.6	38.4
<b>Females</b>			
White	5400	61.6	38.4
Black	2354	50.7	49.3
Hispanic	1600	55.8	44.3
Asian	638	45.8	54.2
Native American	97	57.7	42.3
Other	118	64.4	35.6
<b>Males</b>			
White	5240	54.8	45.2
Black	2103	52.7	47.3
Hispanic	1601	55.9	44.1
Asian	717	41.4	58.6
Native American	106	57.5	42.5
Other	111	58.6	41.4

Table 5. Means and Standard Deviations of Age of Romantic Partners, Age Discrepancy of Romantic Partners, and Duration of Relationships of First Listed Adolescent Romantic Partners by Sex and Age at Interview

	Age of Partner	Age Discrepancy of Partner (Years)	Duration of Relationship (Months)
Total	15.83 (2.50)	0.17	8.41 (13.35)
Males	14.99 (1.90)	0.97	8.06 (15.51)
Females	16.50 (2.68)	-0.57	8.44 (10.83)
Age at interview			
12	12.40 (1.23)	-0.41	8.13 (21.28)
13	13.24 (1.63)	-0.24	6.90 (18.04)
14	14.23 (1.73)	-0.23	7.00 (17.34)
15	15.14 (1.82)	-0.14	6.66 (10.63)
16	15.91 (1.93)	0.09	8.02 (12.63)
17	16.58 (2.17)	0.42	9.14 (11.25)
18	17.35 (2.82)	0.65	10.58 (12.43)

*Note:* For age of discrepancy, a negative score indicates that the nominated partner was older than the respondent and a positive score indicates that the respondent was older than the nominated partner.



Table 6. Means and Standard Deviations of Age of Romantic Partners, Age Discrepancy of Romantic Partners, and Duration of Relationships of First Listed Adolescent Romantic Partners by Race/Ethnicity

	Age of Partner	Age Discrepancy of Partner (Years)	Duration of Relationship (Months)
Race/Ethnicity			
White	15.74 (2.43)	0.18	7.67 (12.5)
Black	15.80 (2.50)	0.13	11.13 (18.35)
Hispanic	16.12 (2.65)	0.11	8.55 (9.57)
Asian	16.02 (2.07)	0.44	7.65 (9.30)
Native American	15.35 (2.37)	0.25	12.19 (29.12)
Other	16.24 (4.06)	-0.28	6.96 (7.77)

*Note:* For age of discrepancy, a negative score indicates that the nominated partner was older than the respondent and a positive score indicates that the respondent was older than the nominated partner.

Table 7. Percent of Adolescents who Reported the Race/Ethnicity of First Listed Romantic Partners by Race/Ethnicity

Race/Ethnicity	Race/Ethnicity of Partner					
	White	Black	Hispanic	Asian	Native American	Other
White	82.1	2.9	11.8	1.6	.8	.7
Black	6.9	85.3	5.1	1.2	.3	1.2
Hispanic	21.4	7.4	65.0	3.6	1.3	1.3
Asian	17.0	4.0	8.9	66.4	.9	2.8
Native American	32.2	18.6	36.8	2.3	7.3	2.8
Other	23.2	7.6	58.6	6.3	1.8	2.4

Table 8. Percent of Adolescents who Reported How They Met Their First Listed Romantic Partners by Sex and Age at Interview

How Adolescents' Know Romantic Partners' Before Relationship Begins							
	Attended Same School	Lived in Same Neigh	Went to the Same Place of Worship	Were Casual Acquaintances	Were Friends	Shared Mutual Friends	Did not Know Before Relationship Began
Total	48.5	5.1	6.2	21.8	39.8	40.4	7.9
Males	51.4	4.7	6.2	19.0	38.5	35.1	7.7
Females	46.3	5.5	6.4	24.7	41.7	45.8	8.0
Age at interview							
12	65.5	3.0	6.0	13.7	50.6	32.1	8.9
13	58.2	6.9	6.9	15.8	51.1	41.1	5.1
14	54.0	5.9	6.6	20.8	48.8	41.2	6.2
15	51.4	5.4	6.7	22.8	43.9	42.2	7.4
16	48.1	5.5	6.2	22.4	38.4	41.1	8.2
17	45.8	4.9	6.5	23.3	36.9	41.3	8.1
18	42.6	4.0	5.5	22.5	32.4	38.0	9.8

Note: *n* = 12, 806

Table 9. Percent of Adolescents who Reported How They Met Their First Listed Romantic Partner by Race/Ethnicity

How Adolescents' Know Romantic Partners' Before Relationship Begins							
Race/Ethnicity	Attended Same School	Lived in Same Neigh	Went to the Same Place of Worship	Were Casual Acquaintances	Were Friends	Shared Mutual Friends	Did not Know Before Relationship Began
White	52.0	4.7	6.5	25.4	43.7	41.6	7.3
Black	44.6	5.4	5.8	17.0	32.5	36.5	10.0
Hispanic	43.2	6.5	5.4	15.1	36.0	39.8	8.1
Asian	46.1	3.3	9.3	22.8	41.0	45.7	5.5
Native American	45.3	6.3	3.1	17.2	45.3	43.0	6.3
Other	45.4	5.3	5.3	33.6	37.5	40.1	4.6

Note:  $n = 12,806$

Table 10. Percent of Adolescents who Reported Various Acts of Intimacy/Commitment within First Listed Adolescent Romantic Relationships by Sex, and Age at Interview

	Thought of Yourselves as a Couple	Went Out Together Alone	Told One Another That You Loved Each Other	Gave a Present to Partner	Saw Less of Other Friends
Total	90.5	77.9	79.4	71.2	53.8
Males	82.5	78.8	81.8	73.4	56.3
Females	87.4	76.6	81.2	68.7	51.1
Age at interview					
12	86.1	53.8	78.5	67.7	38.6
13	83.6	53.7	74.7	54.8	38.1
14	83.2	64.1	76.3	61.1	45.1
15	86.3	73.3	78.6	66.4	49.5
16	84.3	80.5	78.5	71.2	54.4
17	86.0	86.3	79.9	76.3	59.1
18	85.3	86.7	82.4	80.5	61.5
Race/Ethnicity					
White	91.2	79.8	77.8	71.7	54.2
Black	89.9	72.2	81.1	67.7	49.9
Hispanic	89.1	77.7	81.9	72.7	56.5
Asian	89.4	81.7	80.6	75.6	57.1
Native Amer.	93.4	76.9	85.1	72.7	61.2
Other	89.7	81.5	76.0	72.6	45.9

Note:  $n = 12,682$

Table 11. Percent of Adolescents who Reported Various Dimensions of Sexual Behavior within the First Listed Adolescent Romantic Relationship by Sex, Age at Interview

	Held Each Other's Hand	Kissed Each Other	Touched Each Other Under Clothing	Touched Each Other's Genitals	Had Sexual Intercourse
Total	89.2	91.2	62.6	53.7	42.4
Males	88.1	90.0	62.9	54.6	40.9
Females	90.3	92.1	61.8	52.3	42.7
Age at interview					
12	84.2	79.7	28.5	12.7	5.7
13	82.3	78.2	27.9	19.4	12.0
14	85.5	86.2	43.4	33.5	19.9
15	89.3	90.4	55.0	45.7	31.2
16	91.0	93.2	65.5	55.3	43.1
17	90.2	93.6	73.8	65.1	54.2
18	91.2	94.8	78.1	71.5	62.2
Race/Ethnicity					
White	90.8	91.3	63.7	54.4	39.2
Black	84.8	91.2	64.1	55.6	52.5
Hispanic	89.6	92.6	59.4	51.8	41.9
Asian	91.0	86.2	56.1	45.2	37.6
Native Amer.	86.8	91.7	57.9	50.4	41.3
Other	88.4	90.4	61.6	51.4	34.9

Note:  $n = 12,682$

Table 12. Percent of Adolescents Who Reported Various Dimensions of Social Connectedness for the First Listed Adolescent Romantic Relationship, by Sex and Race/Ethnicity

	Told Other People You Were a Couple	Went Out Together in a Group	Met Your Partner's Parents
Total	85.1	74.8	74.4
Male	89.4	72.4	73.1
Female	91.5	76.9	75.3
Age at Interview			
12	86.1	64.6	58.2
13	83.6	66.2	55.9
14	83.2	69.0	65.2
15	86.3	72.7	71.8
16	84.3	74.9	75.4
17	86.0	78.5	80.2
18	85.3	79.4	81.2
Race/Ethnicity			
White	87.4	80.3	78.6
Black	80.5	61.7	70.0
Hispanic	83.9	72.6	69.4
Asian	84.2	77.8	66.0
Native Amer.	86.8	71.9	65.3
Other	83.6	76.0	71.2

Note:  $n = 12,682$

Table 13. Age Discrepancies of Romantic Partners by Couple Type

Discrepancy in Years (Male-Female)	Female Asymmetric Couples	Male Asymmetric Couples	Symmetric Couples	All Couples
-5	0.0%	0.0%	0.6%	0.2%
-4	0.2%	0.2%	0.3%	0.2%
-3	1.1%	1.9%	2.8%	1.8%
-2	4.0%	3.5%	7.5%	4.7%
-1	12.7%	17.8%	22.7%	17.3%
0	31.2%	35.7%	29.9%	32.6%
1	25.8%	25.7%	23.1%	25.1%
2	14.5%	10.6%	10.3%	11.9%
3	7.8%	3.5%	2.2%	4.7%
4	2.4%	1.0%	0.6%	1.4%
5	0.0%	0.0%	0.0%	0.0%
6	0.2%	0.0%	0.0%	0.1%
Mean Difference	.64	.30	.02	.35
95% CI	.51 to .78	.19 to .42	-.13 to .17	.28 to .43

*Note:* A negative score indicates that the female couple member was older than the male couple member and a positive score indicates that the male couple member was older than the female couple member.



Table 14. Frequency of Sexual Intercourse with Partners by Couple Type

Frequency of Sexual Intercourse with Partner			
Couple Type	<i>n</i>	Mean	Trimmed Mean
Female Asymmetric Couples	397	8.84	0.04
Male Asymmetric Couples	393	6.90	0.10
Symmetric Couples	303	21.84	2.17
All Couples	1093	11.75	0.21

Table 15. Frequency of Sexual Intercourse with Partners by Couple Type for Sexually Active Couples

Frequency of Sexual Intercourse with Partner			
Couple Type	<i>n</i>	Mean	Trimmed Mean
Female Asymmetric Couples	83	42.23	16.71
Male Asymmetric Couples	95	28.49	7.23
Symmetric Couples	141	46.94	17.41
All Couples	319	40.22	13.82

Table 16. Selected Path Coefficients for the Analysis of Had Sexual Intercourse

Path	Unstandardized coefficient	Standardized coefficient	<i>p</i> value
Female couple members' actual pubertal dev. to female couple members' perceived pubertal dev.	0.18	0.33	< 0.01
Male couple members' actual pubertal dev. to male couple members' perceived pubertal dev.	0.22	0.47	< 0.01
Female couple members' perceived pubertal dev. to had sexual intercourse	0.05	0.11	< 0.01
Male couple members' actual pubertal dev. to male couple members' depressive symptoms.	-0.30	-0.10	< 0.01
Male couple members' actual pubertal dev. to had sexual intercourse	-0.01	-0.06	0.04
Male couple members' perceived pubertal dev. to had sexual intercourse.	0.20	0.05	0.08
Male couple members' maternal relationship satisfaction to male couple members' depressive symptoms	-1.75	-0.22	< 0.01
Male couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-1.12	-0.12	< 0.01
Female couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-2.19	-0.25	< 0.01

Table 17. Total Effects of Study Variables for Couple Members on Had Sexual Intercourse

Variable	Male Actual Puberty	Female Actual Puberty	Male Maternal Satisfaction	Male Perceived Puberty	Female Maternal Satisfaction	Female Perceived Puberty	Male Depression	Female Depression
Male Perceived Puberty	.219	--	--	--	--	--	--	--
Female Perceived Puberty	--	.182	--	--	--	--	--	--
Male Depression	-.374	--	-1.747	-.342	-.090	--	--	--
Female Depression	--	.020	-1.116	--	-2.186	.033	--	--
Had Sexual Intercourse	-.007	.016	-.021	.021	-.019	.047	-.001	.002

Table 18. Selected Path Coefficients for the Analysis of Frequency of Sexual Intercourse

Path	Unstandardized coefficient	Standardized coefficient	p value
Female couple members actual pubertal dev. to female couple members perceived pubertal dev.	0.18	0.33	< 0.01
Male couple members' actual pubertal dev. to male couple members' perceived pubertal dev.	0.22	0.47	< 0.01
Male couple members' actual pubertal dev. to male couple members' depressive symptoms.	-0.30	-0.10	< 0.01
Male couple members' maternal relationship satisfaction to male couple members' depressive symptoms	-1.75	-0.22	< 0.01
Male couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-1.12	-0.12	< 0.01
Female couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-2.19	-0.25	< 0.01
Female couple members' relationship satisfaction with their mothers to frequency of sexual intercourse	-3.99	-0.07	0.01
Male couple members' perceived pubertal dev. to frequency of sexual intercourse	4.01	0.08	< 0.01
Male couple members' actual pubertal dev. to frequency of sexual intercourse	-1.38	-0.06	0.02

Table 19. Total Effects of Study Variables for Couple Members on Frequency of Sexual Intercourse

Variable	Male Actual Puberty	Female Actual Puberty	Male Maternal Satisfaction	Male Perceived Puberty	Female Maternal Satisfaction	Female Perceived Puberty	Male Depression	Female Depression
Male Perceived Puberty	.219	--	--	--	--	--	--	--
Female Perceived Puberty	--	.182	--	--	--	--	--	--
Male Depression	-.374	--	-1.747	-.342	-.090	--	--	--
Female Depression	--	.020	-1.116	--	-2.186	.033	--	--
Frequency of Sexual Intercourse	-.559	.630	1.129	3.953	-3.921	1.966	.161	-.037

Table 20. Selected Path Coefficients for the Analysis of Consistency of Birth Control  
Every Time Intercourse Occurred

Path	Unstandardized coefficient	Standardized coefficient	p value
Female couple members' actual pubertal dev. to female couple members' perceived pubertal dev.	0.14	0.26	< 0.01
Male couple members' actual pubertal dev. to male couple members' perceived pubertal dev.	0.21	0.49	< 0.01
Female couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-2.63	-0.28	< 0.01
Male couple members' maternal relationship satisfaction to male couple members' depressive symptoms	-2.13	-0.28	< 0.01
Male couple members' maternal relationship satisfaction to female couple members' depressive symptoms.	-2.03	-0.19	< 0.01
Female couple members' perceived pubertal dev. to consistency of birth control every time intercourse occurred	0.09	0.18	< 0.01

Table 21. Total Effects of Study Variables for Couple Members on Consistency of Birth Control

Variable	Male Actual Puberty	Female Actual Puberty	Male Maternal Satisfaction	Male Perceived Puberty	Female Maternal Satisfaction	Female Perceived Puberty	Male Depression	Female Depression
Male Perceived Puberty	.214	--	--	--	--	--	--	--
Female Perceived Puberty	--	.143	--	--	--	--	--	--
Male Depression	-.181	--	-2.133	-.626	-.366	--	--	--
Female Depression	--	-.234	-2.026	--	-2.628	-.548	--	--
Consistency of Birth Control	.007	.014	-.003	.000	.012	.092	-.007	.002



Figure 1: Conceptual Model

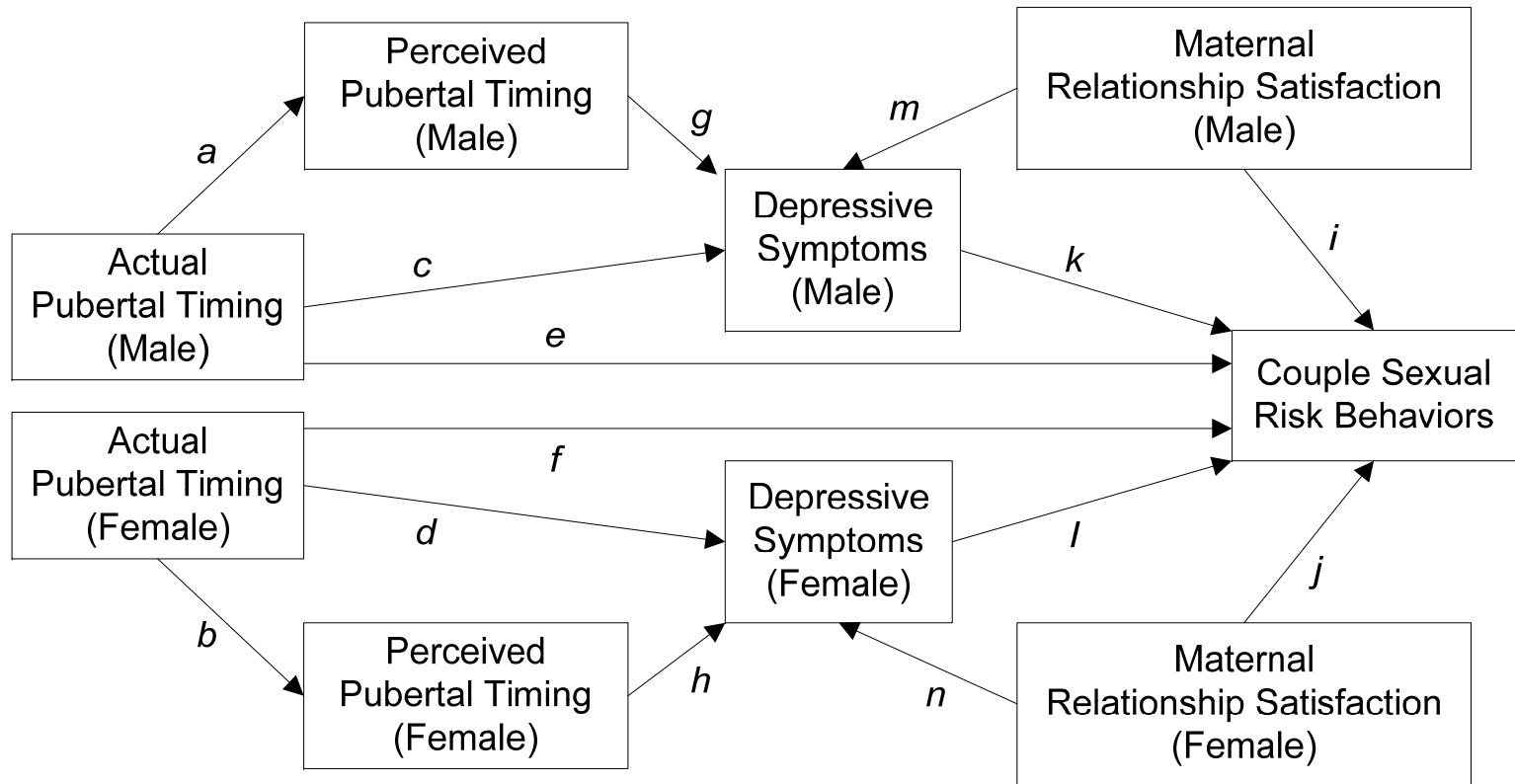
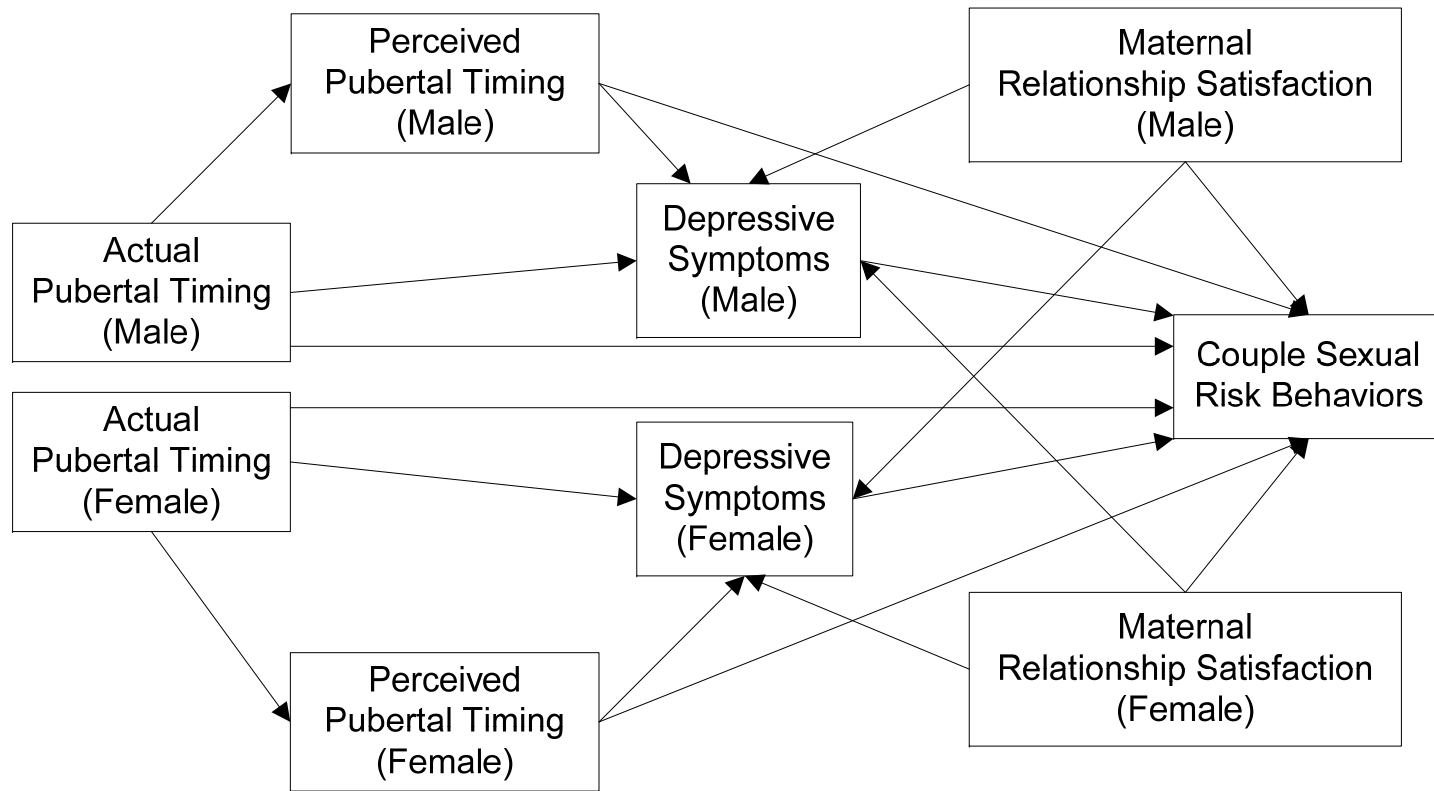


Figure 1: Final Model



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- Zimmer-Gembeck, M. J. (2002). The development of romantic relationships and adaptations in the system of peer relationships. *Journal of Adolescent Health*, *32*, 216-225.
- Zimmer-Gembeck, M. J., & Collins, W. A. (2007). Gender, mature appearance, alcohol use, and dating as correlates of sexual partner accumulation from ages 16–26 years. *Journal of Adolescent Health*, *42*, 564-572.

Zimmer-Gembeck, M. J., & Helfand, M. (2008). Ten years of longitudinal research on U.S. adolescent sexual behavior: Developmental correlates of sexual intercourse, and the importance of age, gender and ethnic background. *Developmental Review, 28*, 153–224.

Zimmer-Gembeck, M. J., Siebenbruner, J., & Collins, W. A. (2001). Diverse aspects of dating: Associations with psychosocial functioning from early to middle adolescence. *Journal of Adolescence, 24*, 313–336.

## VITA

RONA CARTER

### *Education*

- 2005-2009 Florida International University, Miami, FL  
Doctoral Candidate in Developmental Psychology  
Anticipate degree in 2009
- 2002-2005 Florida International University, Miami, FL  
M.S. in Developmental Psychology
- 1999-2001 Florida International University, Miami, FL  
B.A. in Psychology

### *Publications*

- Silverman, W. K. & Carter, R. (2005) Anxiety disturbance in girls and women. In J. Worell & C. Goodheart (Eds.) *Handbook of girls' and women's psychological health*. (pp. 60-68). New York, NY: Oxford University Press.
- Carter, R., Allen, A., Ham, L., & Silverman, W. K. (2007). Suicidal ideation in clinically referred youth with a primary diagnosis of an anxiety disorder. *Depression and Anxiety*, 24, 279 -281.
- Carter, R., Williams, S., & Silverman, W. K. (2008). Cognitive and emotional facets of test anxiety in African American school children, *Cognition & Emotion*, 22, 539 - 551.
- Carter, R., Jaccard, J., Silverman, W. K., & Pina, A. A. (2008) Pubertal timing and its link to behavioral and emotional problems among 'at-risk' African American adolescent girls. *Journal of Adolescence*, doi:10.1016/j.adolescence.2008.07.005.
- Carter, R., Silverman, W. K., Allen, A., & Ham, L. (2008). Measures matter: The relative contribution of anxiety and depression to suicidal ideation in clinically referred anxious youth using brief versus full length questionnaires. *Depression and Anxiety*, doi:10.1002/da.20468.

### *Selected Poster Presentations*

- Williams, S., Motoca, L., Saintil, M., Carter, R., & Silverman, W.K. (2008, November). Child anxiety sensitivity and its relation to perceived parenting behaviors. Poster presented at the annual Association for Behavioral and Cognitive Therapies conference, Orlando, FL.



Pienkowski, M., Gray, C., Hernandez, I., Sangiovanni, P., Alonso, A., Carter, R., & Silverman, W. K. (2008, March). Test anxiety in elementary school children: Re-examining an “old” but useful construct. Poster presented at the annual Anxiety Disorders Association of America conference, Savannah, GA.

Carter, R., Sternstein, M. L., Williams, S., & Silverman, W. K. (2007, March). Test anxiety and symptoms of anxiety disorders in Black children: Beyond social evaluative concerns. Poster presented at the biennial Society for Research in Child Development conference, Boston, MA.

Carter, R., Williams, S., & Silverman, W. K. (2006, June). Understanding cultural influences in the expression of anxiety symptoms in school-age children of color. Poster presented at the annual Black Graduate Psychology Student conference, Indianapolis, IN.

Carter, R., Allen, A., Ham, L., & Silverman, W. K. (2006, March). Suicidal ideation among referred youth with a primary anxiety diagnosis. Poster presented at the annual Anxiety Disorders Association of America conference, Miami, FL.

#### *Selected Oral Presentations*

Rey, Y., Marin, C. E., Carter, R., & Silverman, W. K. (2008, November). Another Look at European-American and Latino Youths’ Treatment Response to Exposure-Based Cognitive-Behavioral Treatment for Phobic and Anxiety Disorders. In E. Varela (Chair), Anxiety in Latino youth: Prevalence, expression, and socio-cultural influences. Symposium conducted at the annual Association for Behavioral and Cognitive Therapies conference, Orlando, FL.

Carter, R. (2007, August). Effects of adolescent depressive symptoms, pubertal timing, and interpersonal relationship satisfaction on sexual risk behaviors in adolescent romantic couples. Paper presented at annual Society of Multivariate Experimental Psychology (SMEP) Minority Student conference, San Francisco, CA.

Carter, R., Allen, A., & Silverman, W. K. (2005, August). Symptom expression of separation anxiety disorder in boys and girls referred to an anxiety specialty clinic. Paper presented at the annual American Psychological Association conference: Psi Chi Awards Ceremony, Washington, DC.

Carter, R., Silverman, W. K., & Pina, A.A. (2002, August). Perception of pubertal timing on symptoms of anxiety and conduct problems in African American adolescent girls. Paper presented at the annual American Psychological Association conference: Psi Chi Awards Ceremony, Chicago, IL.