

Assertiveness during condom negotiation among high-risk  
late adolescent /emerging adult couples:  
The role of relational uncertainty

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## ABSTRACT

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Many urban minority youth are at high risk for HIV and other sexually transmitted diseases (STDs). While consistent condom use remains the most effective intervention for preventing transmission of HIV and other STDs between sexual partners, low levels of assertive communication between romantic partners has been associated with inconsistent condom use.

Guided by Uncertainty Management Theory, the current study hypothesized that high-risk youth with high relational uncertainty would demonstrate low levels of assertiveness during a laboratory-based condom negotiation task with their current romantic partner. It was also hypothesized that assertiveness would be positively correlated with condom use. A video-recall paradigm was used to assess youths' subjective interpretations of their condom negotiation communication with their romantic, opposite sex partner. Dyadic multilevel models revealed that hypotheses were not completely supported. While depressed men with high relational uncertainty showed low assertiveness, depressed women showed high assertiveness. Post-hoc analyses revealed a curvilinear relationship between couples' assertiveness and condom use, with the highest levels of condom use being found among moderately assertive couples.

Unexpectedly, adolescents rated themselves and their partners in almost exactly the same way.

Results suggest that adolescents' condom negotiation is a dynamic process that is influenced by both partners' perceptions and behavior. Results are interpreted at the individual, social-

developmental, and contextual levels. Implications for interventions and future research are discussed.

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## CHAPTER 1

### Introduction

Although condom use has been widely publicized as an effective method for preventing the spread of HIV, rates of HIV infection are currently rising among minority urban men and women ages 12-25 (“high-risk youth”) (CDC, 2008). Researchers have found that high-risk youth consistently use condoms with “casual” partners, but are less likely to use condoms in the context of “committed” romantic relationships (Reece et al., 2010). This may occur because condoms are thought to symbolize a lack of trust and commitment toward one’s partner. However, there is a great deal of variability in the condom use patterns of committed couples. Research is beginning to explore relationship characteristics that allow some committed couples to use condoms more frequently than others. One consistent finding is that couples that assertively negotiate condom use are more likely to use condoms than those who do not (Noar, Morokoff, & Harlow, 2002; Tschann, Flores, deGroat, Deardorff, & Wibbelsman, 2010). Youths’ willingness and ability to discuss condoms appears to be heavily influenced by relational factors. A better understanding of the factors associated with assertive condom communication is therefore necessary (Fortenberry, 2010).

Youth normatively have multiple sexual partners, both sequentially and concurrently. Whereas some sexual partnerships are casual, others involve greater levels of commitment (Bauman & Berman, 2005). Verbal messages are not always used to convey feelings of commitment. As a result, youth are likely to experience *relational uncertainty*, which refers to doubt regarding the commitment level in the relationship (Knobloch & Carpenter-Theune, 2004).

Youth who experience high levels of relational uncertainty may be reluctant to engage in behavior that may threaten the relationship. Because condoms are symbolically associated with “casual” partnerships, youth may interpret condom discontinuation as a sign of commitment. They may be reluctant to discuss condoms with their partner if condoms are thought to disrupt the formation of intimacy in the relationship (Davis et al., 2006; Feeney et al., 1999). Unfortunately, low condom communication often leads to unprotected sex. The present study uses Uncertainty Management Theory to conceptualize how high-risk youth simultaneously envision unprotected sex as a sign of commitment yet hesitate to use condoms when they fear that condoms will interfere with the formation of intimacy. Assertiveness during condom negotiation is set forth as a pivotal component in this process.

Uncertainty Management Theory (Brashers, 2001) posits that during interpersonal interactions, individuals are most comfortable when they feel that can predict the other’s actions. When they cannot predict the others’ actions, individuals usually act in ways that reduce their level of uncertainty. In some situations, however, reduction of uncertainty may lead to a certain negative outcome. In such cases, it may be more adaptive to act in a way that preserves uncertainty rather than risking negative outcome. For example, young romantic couples with high relational uncertainty have been shown to exhibit low assertiveness while discussing the commitment level in the relationship (Knobloch, 2006; Knobloch & Theiss, 2011). This behavior is adaptive because it allows them to maintain their level of uncertainty rather than risking rejection. Conversely, partners who have low uncertainty tend to show greater assertiveness during relationship-defining conversations, possibly because they do not feel that they risk a negative outcome.

Condom negotiation is often considered a relationship-defining conversation by high-risk youth (Kershaw et al., 2007). Youth with high relationship uncertainty may therefore believe that this conversation puts their relationship at risk because they cannot predict their partner's response. Uncertainty Management Theory would predict that youth with high relational uncertainty would attempt to preserve their level of uncertainty by avoiding assertive communication during this interaction. The present study empirically examines youths' condom negotiation processes using this theoretical framework. Specifically, this study places established high-risk couples in laboratory-based condom negotiation task. It is predicted that youth who enter this conversation with high relational uncertainty will demonstrate low levels of assertiveness during the task. It is also predicted that this low assertiveness will in turn be associated with lower levels of condom use. Conversely, youth who enter the conversation with low relational uncertainty are expected to show high assertiveness during the task, and to report higher levels of condom use.

Findings from the present study will contribute to existing research in several ways. First, few studies have examined relational dynamics and condom use in established high-risk couples, instead sampling only individuals. Sampling established couples would lead to a more accurate understanding of relationship dynamics (Widman, Welsh, McNulty, & Little, 2006). Second, to the author's knowledge no studies have measured assertiveness using a laboratory-based condom negotiation task. Because retrospective self-report often differs from actual behavior, laboratory-based paradigms can be useful in supplementing existing research. Third, this study will contribute to theoretical frameworks for future prevention and intervention methodology.

This paper will first outline the scope of HIV infection among high-risk youth. Structural-level variables and individual-level variables that impact the spread of HIV will then be presented. This paper will then turn to relationship-level variables, detailing the developmental aspects of youths' romantic relationships that lead to heightened HIV risk. Relational uncertainty and assertive condom negotiation will be examined as important relationship-level variables in the decision to use a condom. Uncertainty Management Theory will be put forth as a framework for conceptualizing youths' assertiveness during condom negotiation. Finally, a laboratory-based procedure will be proposed for examining the associations between relational uncertainty, assertive condom negotiation, and actual condom use.

### **Background**

Human Immunodeficiency Virus (HIV) is a virus that causes Autoimmune Deficiency Syndrome (AIDS), a disease of worldwide proportion (Pisani, 2008). HIV is transmitted through exchanges of semen, vaginal fluid, and blood. Among heterosexual youth, HIV is primarily exchanged through unprotected anal or vaginal sex. Currently, the consistent use of latex condoms with every sexual partner remains the most effective method of reducing the risk of sexually transmitted infections, including HIV (Garrett, 1994). In the current study, *unprotected sex* is defined as engaging in penile-vaginal intercourse without a condom. Since HIV became a public health concern in the late 1980's, public health campaigns, HIV education, and increased access to condoms have effectively decreased unprotected sex across all racial and ethnic groups (Reece et al., 2010). Despite these developments, rates of new HIV infection are currently increasing among youth who reside in areas with high STI and HIV seroprevalence rates.

Moreover, HIV-related mortality rates among racial/ethnic minorities, particularly African-American and Latinos, are high (CDC, 2009; Gebo, et al., 2005; NYCDHMH, 2007). Continued prevention efforts therefore remain important.

Individuals age 25 and under comprise 50% of new HIV infections in the U. S. (CDC, 2004); 67% of these infections are reported by African-American and Latino youth (CDC, 2008). New York City currently has the highest number of AIDS cases of any American city (CDC, 2007; Jones & Oliver, 2007). 92% of women age 13-24 diagnosed with HIV in New York City are African-American or Latina (NYCDHMH, 2007). African-American and Latino youth living in urban areas are particularly at risk because their engagement in developmentally normative sexual behavior is embedded within social-sexual networks that are high in HIV and STI's. The present study focuses upon these "high risk youth," who are defined as African-Americans and Latinos aged 12-25 living in urban areas of high HIV/STI prevalence or have been diagnosed with an STI.

Researchers have put forth a number of factors to explain the spread of HIV among high-risk youth. Because condom use has been widely studied across different racial and cultural groups, the current discussion will focus upon research regarding high-risk youth. Although the use of condoms prevents the spread of HIV, this seemingly simple behavior is impacted by multiple layers of symbolic, contextual, and interpersonal factors (Karney et al., 2010). Variables influencing condom use fall into three general categories, each of which will be discussed below. *Structural-level variables* are cultural, demographic, and epidemiological factors that lead to the spread of HIV. *Individual-level variables* refer to the cognitions and socioemotional factors that lead to unprotected sex. *Relationship-level variables* are aspects of romantic relationships associated with unprotected sex. At the conclusion of the discussion of

the variables, a model will be presented to explain how relational variables may increase unprotected sex within high-risk romantic dyads.

### **Structural-Level Variables**

#### *Developmental stage as a risk factor*

“Youth” is a developmental period that stretches from approximately age 12 to 25. In the current study, this developmental period is defined as including both adolescence and emerging adulthood. Youth is defined differently in different cultures, but generally refers to individuals who have reached sexual maturity, but have not yet taken on adult responsibilities such as marriage, independent living situations, or financial self-sufficiency (Marcia, 1977). Youth are at particular risk for contracting STI’s (Sexually Transmitted Infections) and HIV because they are likely to have serial, non-overlapping, and overlapping sexual relationships, as will be discussed below (Kelley, Borawski, Flocke, & Keen, 2003). STI’s are highly contagious bacterial or viral infections; up to 40% of sexually-active youth report one or more infection (Forhan, et al., 2009). Having an STI can increase a person’s physiological susceptibility to HIV, making youth particularly vulnerable (Padian, Shiboski, Glass, & Vittinghoff, 1997). Furthermore, individuals with HIV are often unaware of their HIV status because the virus usually remains dormant for up to 10 years (NYCDOH, 2007). This is particularly dangerous for youth who have multiple partners, as they may unknowingly pass HIV to their partners. In addition to these risk factors, young women are particularly vulnerable to HIV infection due to their receptive status during intercourse, and because the young cervix has a high biological susceptibility to STI’s (Eng & Butler, 1997).



### *Racial/ethnic background as a risk factor*

As stated above, African-Americans and Latinos currently report higher rates of new HIV infections than other racial/ethnic groups in the U.S. (CDC, 2008). Researchers have put forth a number of hypotheses as to why this disparity exists. One line of inquiry examines whether these minorities are more likely than Caucasians to engage in “risky sexual behavior,” defined as having unprotected sex or multiple sex partners. Regarding unprotected sex, nationwide surveys indicate that condom use has increased among all racial/ethnic groups over the past 20 years (Reece et al., 2010). Although some surveys show that African-American and Latino men historically used condoms less often than Caucasian men, current rates of condom use are similar across all groups. For example, a 1991 survey found that 45% of Americans from all ages and racial/ethnic groups reported using a condom at last intercourse. In 2001, this rate increased to 60% (Dariotsis, Safaris, Pleck, Astone, & Sonenstein, 2011). Condom use among youth from all racial/ethnic groups has made similar gains over the same time period (Balaji et al., 2008). Although several studies have found that Latino youth currently show low levels of condom use, others indicate that African-American and Latino high-risk youth report *higher* condom use than do Caucasian youth (Brown et al., 2008; Hlaing, de la Rosa, & Niyonsenga, 2007; Santelli, Robin, Brener, & Lowry, 2001). Historical differences in condom use may have contributed to the spread of HIV in minority groups, but current racial/ethnic differences are not adequate in explaining current disparities in HIV infection.

Although condom use is similar across groups, racial differences in multiple partnering persist. *Multiple partnering* is defined as having multiple sexual partners, either in sequence or concurrently (i.e., overlapping in time). Although multiple partnering has

decreased in all racial/ethnic groups over the past 20 years, African-American adults and youth report higher numbers of sexual partners than do other groups (Adimora, Schoenbach, & Doherty, 2007; Adimora, et al., 2002; Hlaing, et al., 2007). In 1991, 43% of African-American high school students reported having four or more sexual partners in their lifetime; this percentage decreased to 27% in 2007 (Balaji et al., 2008). Conversely, rates of multiple partnering among Latinos and Caucasians dropped from 15% to 14% over the same time period, indicating lower overall rates. Although in general rates of multiple partnering among Latinos are not high, many urban neighborhoods of low socioeconomic status are populated by both African-Americans and Latinos (U. S. Census Bureau, 2010). Studies of high-risk urban youth often group these two racial/ethnic groups together due to shared sexual norms and high numbers of mixed African-American/Latino romantic couples (e.g., Abraham, Macaуда, Erickson, & Singer, 2009; Bauman & Berman, 2005). As such, multiple partnering among Latinos in some communities may be higher than is estimated in national surveys.

Although multiple partnering may contribute to higher rates of HIV infection among African-Americans, this factor not sufficient in explaining disparities in infection. Even among populations such as sex workers, who have high levels of multiple partnering, consistent condom use can effectively reduce rates of HIV infection (e.g., Blankenship, West, Kershaw, & Biradavolu, 2008). Moreover, African-American men with low-risk sexual histories are more likely than high-risk Caucasian men to be infected with an STI, indicating that sexual risk behavior alone cannot account for disparities in infection rates (Dariotsis et al., 2011). It has therefore been argued that research focusing on rates of sexual risk behavior pathologizes the sexual behavior of minorities and overshadows more salient

causes of the epidemic (Lane et al., 2004). Researchers have therefore examined broader socioeconomic and epidemiological factors that have led to a concentration of HIV infection in low-income African and Latino communities (Wyatt, et al., 2002).

### *Socioeconomic status as a risk factor*

*Socioeconomic status* (SES) is a rough index of an individual's income, education, and occupation (Bradley & Corwyn, 2002). A disproportionate number of minority individuals reside in low-SES conditions, which is thought to increase their risk for HIV (Adimora, et al., 2002). Some theorists argue that HIV is prevalent in low-SES minority communities due to structural inequalities in American culture (Lane et al., 2004). For example, poverty and the poor quality of inner-city schools create barriers to social mobility (Annie E. Casey Foundation, 2011). Segregation, violence, and racial profiling have contributed to an overrepresentation of African-American and Latino men in the prison system, where HIV rates are 250% higher than they are in the general population. Upon release, incarcerated men may carry HIV from prison to low-SES neighborhoods (Brownsberger, 2000; Butterfield, 2003; Krebs & Simmons, 2002; Pisani, 2008; Thomas, Levandowski, Isler, Torrone, & Wilson, 2008; United States Department of Justice, 2007). Additionally, reduced access to healthcare in low-SES environments results in low access to HIV medication and an increase in STI's (Attia, Egger, Muller, Zwahlen, & Low, 2009; Lane et al., 2004; Perry, Williams, Wallerstein, & Waitzkin, 2008). Youth living in low-SES neighborhoods tend to have sex for the first time at a younger age, which is associated with higher number of partners and hence more opportunities to contract disease (Browning, Leventhal, & Brooks-Gunn, 2004; Manlove, Ryan, & Franzetta, 2007a). These factors combine to create a high prevalence rate of HIV in low-SES minority communities.

Epidemiologically, the spread of HIV in low-SES minority communities has also been linked to “sexual networks” within these communities. African-Americans in low-SES communities often select partners from “sexual networks,” in which several “core” members have sexual relationships with a large number of partners (Adimora & Schoenbach, 2005). Mathematical modeling shows that this pattern of partnering allows for a rapid spread of HIV and STI’s within the network. Youth living in these communities therefore have an increased likelihood of choosing partners with HIV (Laumann & Youm, 1999).

#### *Gender roles among high risk youth*

Gender roles prevalent among low SES minority groups is another structural-level variable that increases HIV risk (Lane, et al., 2004). A gender role can be defined as a culturally-specific guideline for men and women’s behavior (Bowleg, Lucas, & Tschann, 2004). Latino and African-American popular culture tends to idealize physical strength, authority, and power in men (Marin, Gomez, & Tschann, 1993; Organista, Carrillo, & Ayala, 2004). Popular images of African-American musicians, for example, often include hypermasculine males flanked by hypersexualized women, boasting of sexual prowess (Hurt, 2009; Staples, 2006). Social critics have argued that low-SES minority youth may be particularly susceptible to internalizing these gender roles, and argue that these cultural archetypes can undermine HIV prevention efforts (Spencer, 2003; Sullivan, 2003; Wolfe, 2003). Men who identify strongly with hypermasculine traits, for example, appear to believe that condoms interfere with masculinity and virility, or believe that they cannot control their sexual impulses (Dicks, 1994; Pleck, Sonenstein, & Ku, 1993; Villaruel, 1998). Conversely, women who identify with these gender roles may also be less likely insist upon condom use because they may defer to men’s sexual leadership (Deardorff, Tschann, Flores, & Ozer,

2010; Driscoll, Biggs, Brindis, & Yankah, 2001; Zambrana, Cornelius, Boykin, & Lopez, 2004).

Although structural factors impact the condom use patterns of high-risk youth, many African-American and Latino couples report high condom use despite these barriers (DiClemente, et al., 1996; Eaton et al., 2011). Accordingly, researchers have also examined differences between individuals (i.e., *individual-level variables*) that lead some youth to use condoms more consistently than others. These variables are discussed below.

### **Individual-Level Variables**

#### *Cognitive risk factors*

Individual-level variables can be divided into two categories: cognitive or socioemotional. *Cognitive variables* describe individuals' thought processes. In previous years, many researchers considered condom use to be a "health behavior", similar to tuberculosis screening, that could be governed by rational cognitive processes (Rosenstock, Becker, & Becker, 1994). As such, condom use was expected to increase by educating individuals about HIV and condoms, raising their feelings of susceptibility to HIV, and showing them enjoyable aspects of condom use, thereby increasing their intentions to use condoms (Albarracin, Johnson, Fishbone, & Muellerleile, 2001; Azjen & Fishbein, 1980; DiClemente & Peterson, 1994). This framework was heavily researched and influenced many public health campaigns (for examples, see Advocates for Youth, 2009; Alstead, et al., 1999; Campsmith, Dawson, Alstead, Hartfield, & Goldbaum, 1996). However, it has shown limited utility in predicting condom use in many populations, including high-risk youth (Abraham & Sheeran, 1994; Janz, Champion, & Stretcher, 2002). For example, high-risk youth who are knowledgeable about HIV prevention methods do not appear more likely to

use condoms (Boyer, Tschann, & Shafer, 1999; Jemmott, Jemmott, Spears, Hewitt, & Cruz Collins, 1992; Ryan, Franzetta, & Manlove, 2007). Similarly, high-risk youth who believe they are susceptible to HIV are only slightly more likely to use condoms (Boyer et al., 1999; Ryan et al., 2007). Having positive attitudes about condoms is a weak predictor of actual condom use among high-risk youth (Zimmerman, et al., 2007), although it may be a stronger predictor in other populations (Mizuno, et al., 2007; Norton, Bogart, Cecil, & Pinkerton, 2005; Sheeran, Abraham, & Orbell, 1999). Believing that condoms reduce sexual pleasure is a weak predictor of condom use among high-risk youth (Norris & Ford, 1995). Likewise, intending to use condoms only slightly increases the likelihood that an individual will use them, a finding seen both among high-risk youth (Bauman & Berman, 2005) and other populations (Abraham, et al., 1999; Albarracin et al., 2001; Sheeran & Taylor, 1997). Interventions based upon these cognitive variables often result in small gains in condom use that dissipate quickly (for examples, see Coyle, Kirby, Marin, Gomez, & Gregorich, 2004; Johnson, Carey, Marsh, Levin, & Scott-Sheldon. 2003). Many researchers have therefore increasingly moved beyond cognitive models of condom use towards socioemotional and relational factors, which are seen as important predictors of condom use in high-risk youth (Coates, Richter, & Caceres, 2008; DiClemente et al., 2008; Janz, et al., 2002).

### *Socioemotional risk factors*

*Socioemotional variables* describe “an individual’s personality, emotion, and relationships with others” (Santrock, 2007). Unprotected sex is often associated with indices of socioemotional distress. Low self-esteem and depression are associated with low levels of condom use, both among high-risk youth (DiClemente et al., 2001; Kowaleski-Jones & Mott, 1998; Sales, Latham, DiClemente, & Rose, 2001; Seth, Raiji, DiClemente, Wingwood, &

Rose, 2009) and other populations (Hallfors et al., 2004; Kosunen, Kaltiala-Heino, Rumble, & Laippala, 2003; Ramrahka, Caps, Dickson, Moffit, & Paul, 2000). Substance use is also higher among youth who use condoms infrequently, suggesting that condom use is associated with sensation-seeking and impulsive behavior (d'Acremont & Van der Linden, 2007; Hlaing et al., 2007; Steuve & O'Donnell, 2005; Wills, Walker, Mendoza, & Ainette, 2006). Condom use patterns are also associated interpersonal experiences. High-risk youth who experience emotional warmth and open communication with their families tend to report higher condom use than those who do not (Barber, 2011; Crosby, Diclemente, Wingwood, Lang, & Harrington, 2003; Kotchick, Dorsey, Miller, & Forehand, 1999; Li, Stanton, & Feigelman, 2000; Miller, Benson, & Galbraith, 2002). Conversely, those who were abused or neglected as children are less likely to use condoms than those who were not (Sterk, Klein, & Elifson, 2004). Additionally, interpersonal patterns between romantic partners exert a strong influence on patterns of condom use. These variables, termed "relationship-level variables", will be discussed in detail below.

These socioemotional variables are not independent from structural-level variables. Spending childhood in low-SES conditions leads to a higher probability of experiencing abuse, as does being exposed to substance use and experiencing untreated depression (Bradley & Corwin, 2002; Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005; Lorant et al., 2003; Miranda et al., 2003; Ondersema, 2010). Stressors in low-income families may interfere with positive communication (Crosnoe, Mistry, & Elder, 2004; Orthner, Jones-Sanpei, & Williamson, 2004). Romantic relationships of high-risk youth exist in the context of these potentially stressful life experiences.

## Relationship-Level Variables

In the sections above, structural-level and individual-level influences upon condom use have been reviewed. However, researchers have recently begun to view condom use as a behavior of a *romantic dyad* rather than the behavior of an individual (Fortenberry, 2010). Condom use occurs exclusively in the context of two people who are engaged in an intimate encounter. As such, the decision to use a condom is an interpersonal process influenced both by individuals and by the relationship itself (Karney et al., 2010). It is therefore important to understand how condom negotiation takes place in high-risk young couples. Below, the developmental context of relationships will be discussed, followed by a detailed exploration of two relationship-level variables: *relational uncertainty* and *assertive condom negotiation*. These variables will be related to condom use patterns in high-risk youth.

### *Developmental importance of condom use*

Approximately 80% of American youth report being involved in at least one romantic relationship (Carver, Joyner, & Udry, 2003). *Romantic relationships* have been defined as occurring when one person “perceives an ongoing, reciprocated, emotional, erotically charged connection with a partner” (p. xv, Karney, Beckett, Collins, & Shaw, 2007). Romantic relationships during adolescence and emerging adulthood serve several developmental roles, each of which contributes to heightened HIV risk. First, relationships serve as a venue to develop *identity*, which is a primary developmental goal of adolescence. Identity is *a set of personal values regarding relationships and beliefs* (Erikson, 1968). Youth experiment with possible identities by associating with new peer groups and temporarily adopting behaviors (Blatt and Blass, 1990; Hall, 1904; Shulman & Seiffge-Krenke, 2001; Thorne, 2000). Unlike older adults, young people may move from one



romantic relationship to another as they explore the types of partners that they would like to have in the future or take on their partners' peer affiliations (Gebhardt, Kuyper, & Greunsven, 2003; Sanderson & Cantor, 1995). These relationships can range in duration from several days to several years; they often overlap in time. The development of identity therefore leads youth to normatively have multiple romantic partners over a relatively short period of time.

A second developmental goal of adolescence and emerging adulthood is the capacity for *intimacy*. Intimacy involves “self-disclosure, closeness, and mutual assistance” between two individuals (p. 597; Shulman, Laursen, Kalman, & Karpovsky, 1997). Whereas early adolescent relationships are emotionally superficial and often motivated by social status concerns, the relationships of older youth are characterized by emotional intimacy (Furman & Wehner, 1994). By the time emerging adulthood is reached, individuals have often developed the capacity for emotional caregiving and tend to have longer relationships (Furman & Schaffer, 2003; Karney et al., 2007). Because sexual intercourse often accompanies emotional intimacy, this developmental goal also leads to heightened HIV risk.

A third developmental goal of adolescence and emerging adulthood is the ability to *balance* personal identity and emotional intimacy (Blatt & Blass, 1990). In romantic relationships, youth learn to advocate for their own needs and beliefs while gracefully compromising with their partner (Shulman, 2003). Effectively balancing these developmental needs can be challenging. The newness and affective charge of emotional and physical intimacy can interfere with rational decision-making processes (Larson, Clore, & Wood, 1999). Because relationships are highly valued, youth may attempt to maintain them

at all costs, often sacrificing one's own identity in favor of creating and maintaining relationships (Fisher, 2006).

This developmental balance may be directly involved in the act of condom negotiation, which is the interpersonal interaction in which a couple decides whether or not to use a condom in that sexual act. Although many youth would like to use condoms, they appear to have difficulty negotiating condom use when they believe it would threaten their relationship. The following section describes types of youth relationships and the role of condoms within those relationships.

#### *Types of youth sexual relationships*

Sexual activity, defined here as *penile-vaginal intercourse*, is an exciting aspect of many youths' lives. Approximately 50% of all American high school students have had sexual intercourse at least once; many have intercourse 3.9 to 7.4 times per week (Carver et al., 2003; Ku, Sonenstein, & Pleck, 1994; Morrison-Beedy, Carey, Crean, & Jones 2010). Sex can serve interpersonal goals such as building intimacy, expressing love, pleasing a partner, or making another partner jealous (Tracy, Shaer, Albino, & Cooper, 2003). Sex may also serve personal goals such as losing virginity, recreation, exploring identity, building self-esteem, or procuring commodities (Snyder, 2006; Thompson, 1996).

When attempting to understand the condom use patterns of high-risk youth, it is important to understand their subjective categorization of sexual relationships. Researchers often dichotomize sexual partnerships either "main" or "casual", but focus groups and interviews with high-risk youth reveal more complex differentiations. Eight recent qualitative studies of African-American and Latino inner-city youth (mean age=18, total N=423) described varieties of sexual partnerships (Abraham, et al., 2009; Bauman &

Berman, 2005; Bauman, Karasz, & Hamilton, 2007; Collins & Champion, 2011; Guzman, Ikramullah, Manlove, Peterson, & Scarupa, 2009; Jones & Oliver, 2007; Leonard, Young, Schmid, Guzman, & Linick, 2011; Singer et al., 2006). Some sexual partnerships are described as high in *commitment*, which is defined here as *a clear and mutually-shared expectation of ongoing emotional involvement* (Bauman & Berman, 2005). *Committed* high-risk couples often convey their commitment by referring to each other as “hubbey” and “wifey;” they may have a child together and expect that they will have an ongoing relationship (Guzman et al., 2009). The feelings of permanence accompanying committed relationships may be particularly valuable for youth who live in stressful socioeconomic circumstances (Staples, 2006). High-risk youth also describe *romantic but not committed* relationships, which involve sexual encounters and emotional intimacy but have limited expectations of monogamy and an unclear commitment level. *Casual* sexual relationships have no expectation of commitment or monogamy; some involve exchanging sex for commodities, while others are recreational in nature. Casual relationships not rare; a cross-sectional survey indicated that three-fifths of youth reported sexual encounters with someone who was not a “dating” partner (Manning, Giordano, & Longmore, 2005). High-risk youth have stated that it is common for one individual to simultaneously have several types of relationships with different partners (Collins & Champion, 2011; Kelley et al., 2003). Some partnerships remain casual while others progress from casual to committed or vice-versa.

#### *Relational uncertainty in relationships*

Young peoples’ relationships inherently have *relational uncertainty*, which is defined as “doubts people have about the nature of the relationship itself” (p. 178, Knobloch & Carpenter-Theune, 2004). Youth are able to describe many categories of relationships, but

they are not always certain as to where their own sexual relationship falls in this scheme (Furman & Hand, 2006). Although young couples' communication about commitment level has received little empirical attention, the qualitative studies cited above indicate that youth do not always verbally communicate their feelings toward one another (Bauman & Berman, 2005; Singer et al., 2006). Youth may therefore be uncertain about their partners' feelings toward them. Partners' feelings are not always commensurate. In casual partnerships, one partner may desire to increase the commitment level but feel uncertain about the partner's feelings. In fact, a study by Manning and colleagues (2005) of Caucasian youth found that 70% of "casual" partnerships occurred with people who have emotional connections to each other such as friends or ex-relationship partners. Moreover, one-third of respondents indicated that they would like their casual partner to become their "committed" partner. "Committed" youth partnerships can also feel uncertain. Feelings of commitment may grow and dissipate over the course of several weeks. As youth develop their identity, they may "grow out" of relationships over time, become dissatisfied with their current partner, or meet an individual who is closer to their ideal (Polk, Ellen, Chung, Whitener, & Jennings, 2011). One study of high-risk youth found that men reported an average of 16 sexual partners and women reported an average of 9, demonstrating the normative nature of multiple partnerships (Abraham et al., 2009). Multiple partnerships are common even among couples that share a child (Singer et al., 2006). In addition to multiple partnering over time, concurrent partnering (i.e., "cheating") is common. In one sample of high-risk youth, 91% of respondents stated that either they or a partner had had concurrent partners at some point in the past (Bauman & Berman, 2005). Given the ubiquity of multiple partnerships, even highly committed partnerships may feel uncertain (Bauman et al., 2007). For those in "romantic but not

committed” relationships, the future of the relationship is perpetually in question. As a result, relational uncertainty is a normative part of many youths’ relationships.

Although many young couples do not verbally discuss the commitment level in their relationship, levels of commitment are often conveyed indirectly by actions (e.g., holding hands in public, spending time together). As a result, youth may closely watch their partner’s actions for *relationship messages*, which are defined by Theiss (2011) as “latent information that an utterance conveys about the status of a relationship” (p. 4, citing Bateson, 1972). Qualitative studies indicate that many high-risk youth view discontinuation of condoms as a relationship message.

#### *Condoms as a relationship message*

A growing number of qualitative studies have assessed the notion that condoms serve as “relationship messages” in romantic relationships. Studies of youth around the world have found that condoms hold symbolic value as a means of differentiating between main and casual partners (for a review, see Marston & King, 2006). This conception is thought to be the result of AIDS prevention campaigns, which have often associated condoms with disease, promiscuity, and infidelity (Gavin, 2000; Misovich, Fisher & Fisher, 1996). The eight qualitative studies of youth referenced above reflect this symbolism (Abraham, et al., 2009; Bauman & Berman, 2005; Bauman et al., 2007; Collins & Champion, 2011; Jones & Oliver, 2007; Guzman, et al., 2009; Leonard et al., 2011; Singer et al., 2006). Many high-risk youth state that condoms should be used with casual, uncommitted, or “unsafe” partners. For example, one youth stated, “If you don’t trust the person, you’re going to say ‘put [a condom] on’. You know, it’s common sense” (p. 218, Bauman & Berman, 2005). Conversely, unprotected sex is perceived as appropriate as the relationship increases in

commitment. For example, one young man stated, “when I’m first going out with her, I use a condom. But after that, I just turn that shit off... because that’s the female I’m gonna be fucking for a while” (p. 2017, Singer, et al. 2006). If a young person is involved in simultaneous partnerships, it is expected that they use condoms with the “casual” partners, but not with the “main partner” (Abraham et al., 2009).

High-risk youth also indicate that unprotected sex symbolizes commitment because it raises the possibility of pregnancy. When a high-risk couple shares a child, the couple may be commonly expected to have a lifelong emotional or financial connection, although they may not remain in a monogamous relationship (Jones & Oliver, 2007; Singer et al., 2006; Stephens & Few, 2007). Because African-Americans are more likely to opt out of legal marriage compared to other racial and ethnic groups, pregnancy may be seen as a proxy for marriage or a lifelong emotional connection. Latino couples who share a child are likely to eventually marry, and may therefore may see pregnancy as a “foot-in-the door” for marriage (Roempke-Graefe & Lichter, 2002). Because unprotected sex raises the possibility of pregnancy, condoms are further seen as a symbol of commitment (Cowley & Farley, 2001; Stevens-Simon, Kelley, Singer, & Cox, 1996).

Due to this symbolism, communication about condoms may be perceived as a *relationship message*. Insisting upon condom use has been said to signify a lack of certainty about the commitment level of the relationship, an admonition of cheating, or a violation of trust (Bauman et al., 2007; Conley & Rabinowitz, 2004; Gavin, 2000; Singer, et al., 2006). Some young couples rely upon mutual HIV-testing as a substitute for condom use once they have agreed to monogamy, even though that agreement is not always honored by both partners (Abraham et al., 2009; Bolton, McCay, & Schneider, 2009). When condoms are

considered a relationship message, it may be difficult for youth to assertively discuss condoms with their partners.

### *Ambivalence about condoms*

Although youth are able to describe the symbolism of condom use, they often feel ambivalent about condom use in their own committed relationships (i.e., they have mixed or contradictory feelings). Perhaps due to the ubiquity of public-health messages over the past 20 years, both high- and low-risk youth are aware of the health risks posed by unprotected sex (Ryan et al., 2007). Surveys indicate that youth from both high- and low-risk backgrounds report positive attitudes toward condom use and somewhat strong intentions to use them (Crosby et al., 2003; Noar et al., 2006). Qualitative interviews also reveal that high-risk youth often hold the abstract notion that condoms “should” be used consistently. For example, a qualitative study found that 100% of a high-risk sample stated that they intend to use condoms, stating that those who do not use condoms are “childish” or “don’t care about their lives” (p. 254; Bauman et al., 2007). In addition to this abstract intention, many youth also desire to use condoms in their current relationship. Three studies of high-risk couples revealed that 50-59% of respondents wanted to use condoms with their current “main” partner (Leonard et al., 2011; Teitelman, Tensile, Bohinski, Jemmott, & Jemmott, 2011; Tschann, et al., 2010).

The desire to use a condom, however, may be met with ambivalence if it is perceived to interfere with relationship formation and maintenance. As stated above, romantic relationships involve the balance of two developmental needs: identity formation and emotional intimacy. Rosenthal, Gifford, and Moore (1998) proposed that these two needs conflict when deciding whether to use a condom. With regard to identity formation, high-

risk youth may intend to maintain condom use throughout all of relationships in order to protect their health, prevent pregnancy, and concentrate on education or other personal goals. At the same time, the desire for emotional closeness with one's partner is also an important developmental need. Given the prevalence of relational uncertainty and the developmental importance of relationships, obtaining and maintaining commitment may be highly valued. One study of young couples found that condom use declined slightly as the relationship increased in emotional importance (Manning, Giordano, Longmore, & Flanigan, 2009), suggesting that goals of self-protection may become secondary as intimacy increases.

#### *Variability in couples' condom use*

The evidence above suggests that condom use presents a developmental dilemma for many youth. However, condom use patterns vary considerably across and within high-risk couples, suggesting that some couples are able to maintain their relationship *and* use condoms, whereas others are not. Consistent with qualitative evidence, condom use appears much easier to implement in "casual" rather than "committed" couples. For example, high-risk youth are 3 to 4 times more likely to use condoms "consistently" in "casual/not very close" relationships than in "main/very close" relationships (Foulkes, Pettigrew, Livingston, & Niccolai, 2009; Friedman et al., 2001). A cross-sectional study found that condom use is 20% lower with "relationship partners" than with "casual partners" (Reece et al., 2010). In "committed" relationships, however, condom use is not absent entirely; studies of high-risk couples indicate that only 37% of respondents "never" used condoms with their current partner (Crosby et al., 2000; Tschann et al., 2010). Approximately 35-49% of long-term high-risk couples use condoms "consistently", suggesting that many couples are able to make condoms part of their sexual encounters despite their symbolic nature (Brady, Tschann,



Ellen, & Flores, 2009; Crosby et al., 2000; Tschann et al., 2010). The remaining 26-51% of couples report using condoms “inconsistently,” a sporadic strategy that does not protect couples from HIV. For example, some couples gradually abandon condom use, with the overall correlation between relationship length and condom use hovering around -.20 (Brady et al., 2009; Ku et al., 1994; Plichta, et al., 1992; Tschann et al., 2010). Other couples report using condoms at approximately 45% of their sexual encounters, meaning that they use a condom approximately every other time that they have sex (Fortenberry, Tu, Harezlak, Katz, & Orr, 2002).

Given the considerable variation within the condom use patterns of high-risk couples, it is important to explore the characteristics that lead some couples to use condoms more often than others. In the following section, condom negotiation will be put forth as a venue in which youth must balance their competing developmental needs. Evidence will then be presented to show that youth who assertively negotiate condoms with their partners are more likely to use condoms than those who do not. Relational uncertainty is put forth as a barrier to assertiveness. Uncertainty Management Theory will be set forth as a theoretical framework for conceptualizing youths’ assertiveness during condom negotiation.

### ***Assertiveness during condom negotiation***

#### *What is condom negotiation?*

Youth are forced to balance identity formation and intimacy during the act of condom negotiation. Condom negotiation is an interpersonal interaction, usually held in the context of an intimate sexual encounter, wherein the couple decides whether or not to use a condom during that sexual act. Youth report using a variety of direct and indirect methods of communicating the desire to use or not to use condoms, ranging from a direct verbal

statement to moving one's body away from the other (Lam, Mak, Lindsay, & Russell, 2004; Noar, Zimmerman, & Atwood, 2004). For example, nonverbal condom negotiation can involve one partner reaching for a condom a moment before intercourse, or one youth physically nudging their partner away from a condom. Verbal requests for condom use can be as simple as whispering "put it on," or as complex as a lengthy discussion prior to intimacy. When conceptualizing condom negotiation, it is important to keep in mind that this interaction is usually charged with eroticism, vulnerability, and physical/emotional arousal.

### *The role of assertiveness*

Numerous studies of high-risk youth have shown that youths' assertiveness regarding condom use is directly linked to their condom use. The present study defines assertiveness as *active negotiation with a partner regarding desires and beliefs*. The following variables, all of which are related to assertiveness regarding condoms, have been linked with higher levels of condom use in high-risk youth ( $r = .40-.45$  range): frequency of talking to a partner about AIDS or condoms (Diclemente, 1991; Norris & Ford, 1995), comfort during condom negotiation (Sales et al., 2010), assertiveness during condom negotiation (Noar, Morokoff, & Redding, 2002), making a direct verbal request to use condoms (Tschann et al., 2010), and self-efficacy regarding condom communication (Diclemente et al., 2001; Guzman et al., 2003). Conversely, general sexual communication (i.e. communication about sex that does not include condoms) and non-verbal messages are inconsistent predictors of condom use, highlighting the importance of explicit verbal condom communication (Deardorff et al., 2010; Tschann & Adler, 1997).

Although assertiveness may appear to be a straightforward route to condom use, many youth do not feel comfortable discussing condom use with their partners. A study of

high-risk Latina youth revealed that only half of all respondents stated that they were comfortable discussing condom use with a current or recent sexual partner; those who were uncomfortable reported low condom use (Guzman et al., 2003). A recent study of high-risk African-American youth women showed that only 33% of respondents discussed safer sex at their most recent sexual encounter (Morrison-Beedy et al., 2010). Other studies of youth have also documented difficulty discussing condoms their partners (Coleman & Ingham, 1999; Gebhardt, Kuyper, & Dusseldorp, 2006). Furthermore, studies of high-risk youth have found that up to 50% have consented to unprotected sex with their partner, even when they wanted to use a condom (Smith, 2003; Teitelman et al., 2011; Tschann et al., 2010). Although youths' difficulty with condom negotiation may be partly influenced by their developmental level of comfort with sexual communication, research also indicates that youths' beliefs about their partner and relationship can impact their assertiveness. Youth who believe that their relationship is threatened by condom use may have difficulty with assertiveness. Uncertainty Management Theory provides a potentially useful framework of studying the associations between relational uncertainty, assertive sexual communication, and rates of condom use.

### **Uncertainty Management Theory**

Uncertainty Management Theory (Brashers, 2001) evolved from an earlier interpersonal communication theory called Uncertainty Reduction Theory, developed by Berger and Calabrese (1975). Uncertainty Reduction Theory sought to predict human behavior during initial interactions (i.e., when two people meet for the first time). Berger and Calabrese proposed that people meeting each other for the first time experience uncertainty about the other person, resulting in anxiety. These researchers defined uncertainty as both (a) the inability to predict

how an individual will behave in the initial meeting, and (b) the appropriateness of individual responses in the initial meeting. In order for an individual to formulate a response in this type of situation, it was first necessary to reduce uncertainty about the other individual. Uncertainty could be reduced by either observing the other individual or by directly asking them questions (Brashers, 2007). However, researchers have also found that individuals do not consistently act to reduce uncertainty, either during initial interactions or more broadly across various human interactions (Gudykunst & Nichida, 1984; Kellerman & Reynolds, 1990). Brashers (2001; 2007) thus proposed Uncertainty Management Theory, which postulates that individuals are sometimes motivated to preserve (rather than reduce) their level of uncertainty. He proposed that during highly risky situations, reducing uncertainty might result in a certain negative outcome. In such cases, individuals may be motivated to act in a way that maintains their level of uncertainty because such uncertainty is preferable to a certain negative outcome.

Brashers' theory has previously been applied to romantic couples' communication patterns (Knobloch & Solomon, 2005). As stated earlier, relational uncertainty is defined as "the doubts people have about the nature of the relationship itself" (p. 178, Knobloch & Carpenter-Theune, 2004). Romantic partners as well as opposite-sex friends are often uncertain about the state of their relationships, particularly in the early stages of relationships. They often desire to reduce their uncertainty about the state of their relationship. Those who are highly uncertain about their relationship, however, have a reasonable suspicion that such discussions may end in relational dissolution or a disappointing outcome (Knobloch, Miller, Bond, & Mannone, 2007). To avoid the risk of relational dissolution, such individuals tend to avoid conversations in which relational messages (i.e., implicit or explicit communication about the nature of the relationship) are discussed. Studies of dating couples and opposite-sex friends have shown that individuals

high in relational uncertainty avoid conversations with their partners that are likely to include relational messages (Afifi & Burgoon, 1998; Knobloch & Carpenter-Theune, 2004; Knobloch & Theiss, 2007).

Guided by Uncertainty Management Theory, Knobloch and colleagues performed a series of studies using primarily Caucasian university students and adult married couples. Established romantic couples were asked to engage in relationally-salient conversations in the laboratory. They found that relational uncertainty impacted these conversations in several important ways. First, participants who reported high relational uncertainty also reported high levels of stress during the conversation (Knobloch & Solomon, 2005). Moreover, those reporting high relational uncertainty perceived their conversations as threatening to the relationship, whereas those exhibiting low relational uncertainty did not feel threatened (Knobloch et al., 2007). Additionally, those reporting high levels of uncertainty felt that their partner's relational messages held great consequence for the future of their relationship (Knobloch & Solomon, 2005). Finally, Knobloch performed a study in which participants were asked to leave answering machine messages for their partners, asking them on a date (Knobloch, 2006). Those high in relationship uncertainty left messages that exhibited low levels of assertiveness, explicitness, and fluency, whereas those low in relationship uncertainty left assertive, confident messages. Together, these findings suggest that romantic partners who are high in relational uncertainty tend to feel threatened by relationally-salient conversations. As a result, they tend to maintain their level of uncertainty by avoiding such conversations entirely. When forced to enter such conversations, these individuals may heavily weight their partners' relational messages and avoid providing assertive messages of their own.

As stated above, there is a high potential for relational uncertainty in the sexual partnerships of high-risk youth. Because of the perception that condoms are not used in committed partnerships, youth with high relational uncertainty may view condom negotiation as a relationally-threatening interaction because it may result in decreased commitment. Given the value placed upon relationship maintenance, maintaining a high degree of uncertainty about the relationship may be preferable to certain negative outcome. Uncertainty Management Theory therefore suggests that relational uncertainty would lead to low assertiveness during condom negotiation. Conversely, low levels of relational uncertainty would be associated with high assertiveness during condom negotiation. A number of empirical studies suggest that this is the case.

#### *Relational uncertainty and assertiveness*

During condom negotiation, youth must balance identity and emotional closeness. In this sense, condom negotiation is similar to any type of conflict negotiation between romantic partners. According to Noom, Dekovic, and Meeus (2001), successful conflict negotiation occurs when an individual can express their views considerately, tolerate their partner's views, and integrate those views in a way that maintains the individuality of both partners while allowing them to feel connected. Individuals who are able to alternate between advocating for themselves and listening to others show positive markers of mental health (Kugler & Coleman, 2009).

As stated above, the balance between identity and intimacy is difficult for many youth. Observational studies have shown that youth conflicts are normatively more harmonious and less conflictual than those of married partners, possibly because many youth believe that conflict threatens their relationships (Gottman, Swanson, & Swanson, 2002;

McIsaac, Connolly, McKenney, Pepler, & Craig, 2008; Welsh, Galliher, Kawaguchi, & Rostosky, 1999). While this is developmentally normative, youth who are highly uncertain about their relationships may excessively inhibit their self-expression during conflict. This occurs because they may be afraid of destroying the relationship (Harper & Welsh, 2007; Harper, Dickson, & Welsh, 2006; Knobloch & Theiss, 2011). Although inhibited self-expression is intended to maintain the relationship, youth who refrain from engaging in conflict tend to feel very uncomfortable during conflicts, are often dissatisfied with the outcomes of those conflicts, and are often dissatisfied with their relationships overall (Dailey & Palomares, 2004; Knee, Lonsbary, Canevello, & Patrick, 2005; Smith, Welsh, & Fite, 2010). Moreover, low assertiveness is also associated with negative psychosocial indices such as eating disorders, depression, and involvement in dating violence (Gratch, Bassett, & Attar, 1995; Woods, 1999; Zaitsoff, Geller, & Krikameswaran, 2002). Assertive negotiation appears to be an important marker of healthy romantic relationships, but relational uncertainty may interfere with assertiveness.

#### *Relational uncertainty and condom negotiation*

Condom use appears to be another situation in which relational uncertainty leads to low assertiveness. As stated above, youth often interpret condom talk as “relationship messages.” Although condom negotiation has not, to the author’s knowledge, been studied using the framework of Uncertainty Management Theory, existing evidence suggests that youth who are high in relational uncertainty have difficulty with assertive condom negotiation. This often results in unprotected sex. Relational uncertainty may cause youth to show low assertiveness during condom negotiation because (a) they do not want to send

negative relationship messages to their partner, and (b) they want to gauge their partner's commitment level.

Uncertainty Management Theory would predict that youth who are high in relational uncertainty refrain from sending "relationship messages" to their partners. This behavior functions to maintain the relationship. Existing literature suggests that this dynamic exists in sexual situations in general, as well as condom negotiation in particular. Studies of college students confirm that individuals with high relational uncertainty often inhibit their communication during sexual situations. They may consent to unwanted sex with a relationship partner because they believe that refusal will disrupt the relationship (Brassard, Shaver, & Lussier, 2007; Gentzler & Kerns, 2004; Impett, Gordon, & Strachman, 2008; Impett & Peplau, 2002). This appears to extend to condom use. Youth who are uncertain of their partners' commitment level report infrequent condom use (Cooper, Shaver, & Collins, 1998; Feeney, Kelly, Gallois, Peterson, & Terry, 1999; Gebhardt et al., 2003; Strachman & Impett, 2009). In high-risk and low-risk samples, many youth explicitly state that they do not use condoms because they believe that their partner does not want to use them. This association is relatively strong, ranging from .55 to .62 (Brown et al., 2008; Plichta, Weisman, Nathanson, Ensminger, & Robinson, 1992; Tschann et al., 2010; Villaruel, Jemmott, Jemmott, & Ronis, 2007). Youth have also stated that they do not insist upon condom use because they believe it would cause their partner to leave them or date other people (Bowleg et al., 2004; Diclemente, 2010; Flaskerud, Uman, Lara, Romero, & Taka, 1996; Sales et al., 2010). Together, these findings suggest that preoccupation with relationship maintenance can interfere with condom negotiation; youth with high relational uncertainty may feel that condom communication threatens the relationship. Several



qualitative examples illustrate this dynamic. One high-risk young woman in a qualitative interview stated that during sex, “You so wrapped up in what this guy is telling you, you not actually thinking about yourself. Damn, he love me. Damn, he want to be with me. Damn, what if I tell him to put a condom on? Will he leave me?” (Singer et al., 2006; p. 2017). In such cases, low assertiveness functions to maintain the relationship and to maintain uncertainty; it also results in low condom use. Conversely, a high-risk couple in a different study illustrated how low relational uncertainty can facilitate assertive condom negotiation. This couple demonstrated low uncertainty by discussing their desire to have a baby together. They also openly discussed their desire to postpone pregnancy, saying, “we should wait until we get older, so we should use condoms now” (Leonard, et al., 2011). In this case, the couple had low uncertainty about their relationship, so they were able to discuss condoms without delivering negative relationship messages.

Uncertainty Management Theory would also predict that youth who are high in relational uncertainty tend to interpret their partner’s behavior as “relationship message;” as such, they may watch their partner rather than asserting themselves. Evidence confirms that youth who are high in relational uncertainty may use condom negotiation to gauge partner commitment. Youth and adults with high relational uncertainty tend to view sex as an expression of love, and may use sexual encounters to gain assurance about their partner’s feelings or to build intimacy (Butzer & Campbell, 2007; Davis, Shaver, & Vernon, 2004; Tracy et al., 2003). Some youth may gain information about their partner’s feelings from whether or not the partner introduces a condom into their sexual encounter (Alvarez & Garcia-Marques, 2011; Bolton et al., 2010; Conley & Rabinowitz, 2004; Kershaw et al., 2007). Rather than risking rejection by introducing condoms themselves, they may preserve

their uncertainty by interpreting their partner's condom behaviors as relationship messages. High-risk young women in several focus-group studies stated that they suspected their partner of being unfaithful, but they took their boyfriend's lack of condom use as a sign that they may be incorrect (Sobo, 1993; Jones & Oliver, 2007). One young African-American woman stated, "it's just between me and him because, like, he's only having sex with me and he's not using a condom so I must be the only one" (Bauman et al., 2007, p. 261). Other young women reported that during sex, their boyfriend said that they would stay in the relationship if they became pregnant. This caused them to feel more comfortable with unprotected sex because they interpreted it as a sign of partner commitment (Bauman & Berman, 2005). In these scenarios, however, condom use was not verbally discussed; therefore a degree of uncertainty remained despite engaging in unprotected sex.

It is possible that some youth enter condom negotiation with a high level of commitment and a strong desire to have unprotected sex (Bauman et al., 2007). Although this is likely true among some couples, the research discussed above suggests that this is not normative. If a youth indeed experiences high relationship certainty and simultaneously has a strong desire to have unprotected sex, Uncertainty Management Theory would predict that this youth would assertively advocate for his or her position. This would occur because the youth would not experience condom negotiation as a relationally-threatening conversation.

Although relational uncertainty and difficulty with condom negotiation may be present in many young couples, this dynamic may be exacerbated by socioemotional factors. For example, youth who experience depression, low self-esteem, negative family experiences, and abusive romantic relationships have a high likelihood of experiencing relational uncertainty (Abela, et al., 2005; Brennan & Bosson, 1998; Styron & Bulman,

1997). These experiences are also associated with low condom use and low assertiveness (Harper, et al., 2006; Teitelman et al., 2011; Wingwood, Diclemente, McCree, Harrington, & Davies, 2001). As stated previously, high-risk youth have an increased likelihood of being exposed to these socioemotional stressors due to their environment. Although the present study does not examine these contextual and socioemotional variables *per se*, it is important to keep in mind that high-risk couples' relational uncertainty and assertiveness are embedded within this context.

In summary, the evidence presented above suggests that high-risk youth view condom use within romantic relationships as a symbol of relational uncertainty. Youth with high relational uncertainty may allow their partner to make decisions about condom use rather than assertively engage in condom negotiation. Ample evidence also suggests that a lack of assertive condom negotiation leads to unprotected sex. Uncertainty Management Theory predicts that individuals with high relationship uncertainty will be reluctant to engage in assertive condom negotiation. Nonassertive condom negotiation allows youth to maintain their level of uncertainty about the relationship. Conversely, youth with low relational uncertainty can assertively negotiate condom use because they do not believe that it would threaten their relationship. The present study will explore the associations between these constructs by observing couples as they negotiate condom use.

### **Measuring condom negotiation**

Although many studies have examined condom negotiation in youth, a number of methodological concerns exist. First, although numerous studies have stressed the importance of relationship context, very few studies have sampled both members of the same couples, instead sampling individuals or only females (Morrison-Beedy et al., 2010; Sales et

al., 2010; Soler et al., 2000; Welsh & Shulman, 2008; Widman et al., 2006). This is problematic because the same individual may act differently with different partners. In established relationships, youths' self-reports of condom communication may differ from the reports of their partner (Polit-O'Hara & Kahn, 1985; Widman et al., 2006). Similarly, observational studies have shown youths' self-ratings are often uncorrelated with the ratings of their partner and trained observers (Welsh, Galliher, & Powers, 1998). These issues highlight the importance of sampling both members of the same romantic couple.

Another methodological problem is that researchers generally use retrospective self-report questionnaires or interviews to study condom negotiation (e.g., Sales et al., 2010; Soler et al., 2000; Tschann et al., 2010). Using self-report survey data to assess events that occurred several days or weeks earlier may lead to inaccurate reporting and social desirability bias (Marlowe & Crowne, 1960; Pisani, 2008). Other studies have countered these problems by giving participants a daily diary to fill out regarding sexual behavior (e.g., Strachman & Impett, 2009) or by asking participants to read and respond to vignettes about condom use (e.g., Efe, 2009). However, researchers have not yet designed a paradigm that approximates the act of condom negotiation.

Laboratory-based observational research has been used to study romantic interactions since the early 1970's (Gottman et al., 2002). Welsh and Dickson (2005) introduced a lab-based method called "video-recall". In this paradigm, couples are first videotaped while discussing a topic. Partners then individually watch a videotape of the discussion, and rate their own behavior and their partners' behavior over the course of the discussion. This method provides insight regarding couple members' thoughts and feelings during the discussion. To this author's knowledge, no laboratory-based study of dating couples has

examined couples while they are discussing sexual behavior, specifically condom negotiation. The present study fills this gap by videotaping high-risk couples as they discuss condom use in a laboratory, then using a video-recall method to measure their thoughts and feelings during the discussion.

### **Statement of the problem**

To many youth, unprotected sex in a relationship connotes commitment between partners (Bauman & Berman, 2005). Conversely, insisting on condom use may imply that one partner does not trust the other. However, high levels of assertive condom communication are associated with high levels of condom use, even among committed couples (Tschann et al., 2010; Widman et al., 2006). This suggests that assertiveness during condom negotiation plays an important role in young couples' decision to use a condom. Exploring barriers to assertive condom negotiation among high-risk couples is therefore an important area for research. It may also have important implications for intervention efforts.

### **Purpose of study**

The present study examines the role of relational uncertainty in the condom negotiation of high-risk couples. A number of studies have shown that youth with high relational uncertainty exhibit avoidance of relationally-salient conversations and show low assertiveness during conflictual and sexual encounters. Youth with high relational uncertainty also show low levels of condom use. Guided by Uncertainty Management Theory, the present study aims to determine whether assertive sexual communication mediates the relationship between relationship uncertainty and actual condom use.

## **Need for study**

HIV prevention strategies are currently insufficient in preventing new HIV infections in urban youth (Coates, et al., 2008). The current study aims to examine relational and interpersonal correlates that may lead to low condom use in established relationships. This may contribute to the existing literature in several ways.

First, this study takes into account relational factors and interpersonal behaviors that may interfere with condom negotiation. An understanding of these factors may inform intervention and psychoeducational strategies by helping youth identify feelings and behaviors that interfere with effective condom negotiation. Numerous intervention studies have found that identifying feelings and actions can lead to positive behavior change (Beck & Fernandez, 1998; Reinecke, Ryan, & Dubois, 1998).

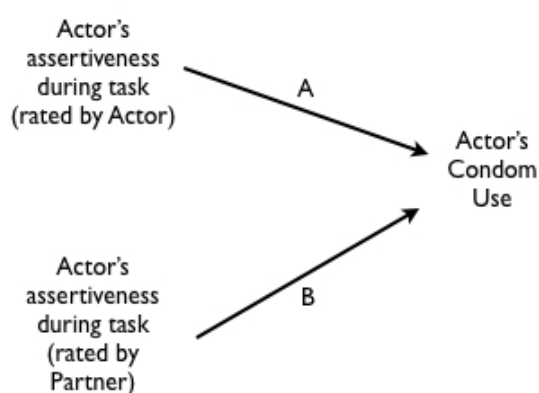
Second, this study utilizes observational methodology to measure assertiveness during condom negotiation in vivo. Previous studies have relied upon retrospective self-reports, which may not be accurate.

Third, this research makes a theoretical contribution to the existing literature in youth sexual development. As mentioned above, research shows that many youth see unprotected sex as a sign of love and commitment. At the same time, other research indicates that unprotected sex is associated with negative psychosocial indices and non-assertive behavior during condom negotiation. Using Uncertainty Management Theory, this study aims to reconcile these findings, potentially resulting in a better understanding of condom non-use in established high-risk couples. In order to examine the relationship between condom use, relational uncertainty, and assertive sexual communication, data from a larger study of high-risk youth was utilized.

## Hypotheses

**Hypothesis 1:** Previous studies using self-report methodology have found that youth who report assertive condom negotiation have an increased likelihood of using condoms (Noar et al., 2002; Tschann et al., 2010; Zamboni, Crawford, & Williams, 2000). As such, it is hypothesized assertiveness during a condom negotiation task will be positively associated with self-reported condom use (Figure 1).

*Figure 1. Hypothesis 1: Using two measures of assertiveness to predict condom use*



*Research hypotheses associated with Hypothesis 1:*

1. An increase in individual  $i$ 's self-reported assertiveness during a condom negotiation task will predict an increase in  $i$ 's self-reported condom use (Figure 1, path A).
2. An increase in individual  $i$ 's partner's assessment of participant  $i$ 's assertiveness during a condom negotiation task will predict an increase in  $i$ 's self-reported condom use (Figure 1, path B).

*Statistical analyses:* To test this hypothesis, one dyadic HLM model will be run (Kenny, Kashy, & Cook, 2006), simultaneously using both measures of assertiveness as independent variables. Actor's self-reported condom use will be the dependent variable. Relationship length, gender, and an individuals' desire to use a condom will be controlled.

**Hypothesis 2:** Uncertainty Management Theory predicts that when individuals are faced with an uncertain situation, they will act to preserve uncertainty if reducing uncertainty may result in a certain negative outcome. It is therefore predicted that relational uncertainty will be inversely associated with assertiveness during condom negotiation. That is, individuals who have high levels of relational uncertainty will preserve their uncertainty by exhibiting low assertiveness during condom negotiation. Conversely, it is predicted that individuals with low levels of relational uncertainty will show high assertiveness.

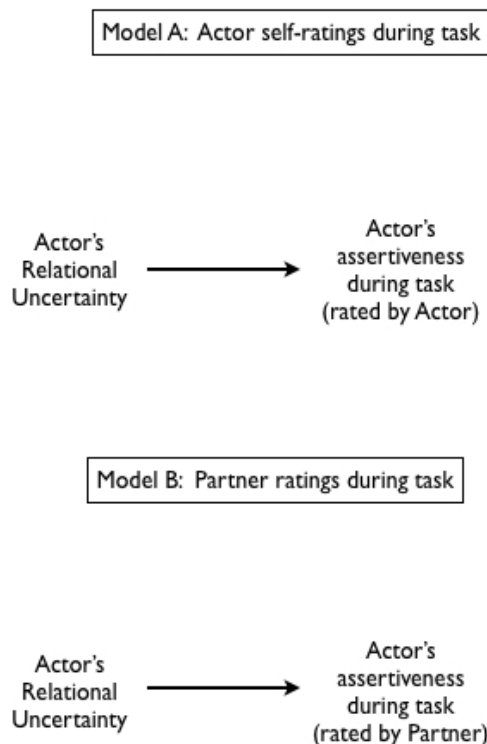
*Research Hypotheses associated with Hypothesis 2 (see Figure 2):*

1. A decrease in participant *i*'s relational uncertainty will predict a decrease in participant *i*'s assertiveness during condom negotiation as measured by self-ratings during condom negotiation task (Figure 2, Model A).
2. A decrease in participant *i*'s relational uncertainty will predict a decrease in participant *i*'s assertiveness during a condom negotiation task as measured by participant *i*'s partner's ratings of participant *i* (Figure 2, Model B).

*Statistical analyses:* Two dyadic HLM models will be run (See Figure 2). In the first model, relational uncertainty will be used to predict assertiveness (rated by actor). In the second model, relational uncertainty will be used to predict assertiveness (rated by partner). A Bonferroni correction will be used to control for Type I errors. This prediction will be tested using two measures of assertiveness, as detailed above (See figure 2). Relationship length and gender will be controlled for in all analyses. Depression will be included as a covariate because youth depression has been associated with low condom use (Shrier, Harris, Sternberg, & Beardslee, 2001), rejection sensitivity in romantic relationships (Murphy & Bates, 1997), relational



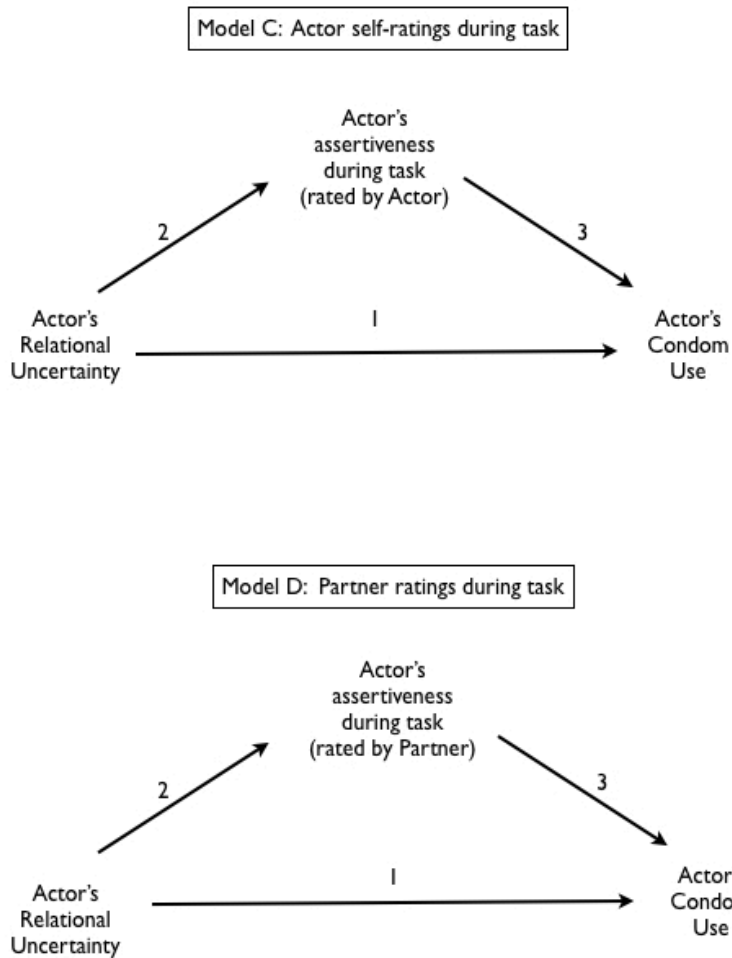
Figure 2. Using relational uncertainty to predict assertiveness: Two Models (Hypothesis 2)



uncertainty (Knobloch & Knobloch-Fedders, 2010) and low self-assertion (Harper et al., 2006; Prinstein, Borelli, Chea, Simon, & Aikins, 2005).

**Hypothesis 3:** Because condom use is influenced by relationship context, researchers are actively seeking a model of safer-sex decision making among high-risk youth that includes relational factors (Coates, et al., 2008). Previous research suggests that relational uncertainty is inversely correlated with condom use (e.g, Strachman & Impett, 2009). Guided by Uncertainty Management Theory, it is hypothesized that relational uncertainty is inversely associated with assertiveness during condom negotiation, which is then positively associated with condom use. That is, assertiveness during a condom negotiation task is predicted to mediate the association between relational uncertainty and self-reported condom use (see Figure 3). Specifically, individuals with low relational uncertainty are expected to report high condom use (Path 1). This

Figure 3. Mediation models predicting condom use: Two Models (Hypothesis 3).



relationship is hypothesized to be mediated by assertiveness, with low relational uncertainty leading to higher assertiveness (Path 2) and higher condom use (Path 3).

*Research Hypotheses Associated with Hypothesis 3 (see figure 3):*

1. Participant *i*'s assertiveness during condom negotiation (as participant *i*'s partner's ratings of participant *i*'s assertiveness) will mediate the relationship between participant *i*'s relational uncertainty and participant *i*'s self-reported condom use (Figure 3, Model C).
2. Participant *i*'s assertiveness during condom negotiation (as participant *i*'s partner's ratings of participant *i*'s assertiveness) will mediate the relationship between participant *i*'s relational uncertainty and participant *i*'s self-reported condom use (Figure 3, Model D).

*Statistical analyses:* To test each of these models, a path model would be the preferable approach. However, the dyadic nature of the data and the small sample size (N=72) render this approach unfeasible. As an alternative, multistep dyadic HLM models will be used to test for mediation. Two multistep models will be run, each one using a different measure of assertiveness as the mediating variable. In the first step of each model, the two relational uncertainty will be used to predict condom use. In the second step of each model, assertiveness will be entered as an additional predictor. The first and second steps of each model will be compared to determine whether assertiveness significantly improves model fit. Relationship length, depression, and gender will be included as covariates in both models.

## CHAPTER 2

### **Method**

#### *Participants*

The data used in this study was derived from a larger study of heterosexual young couples in New York City. The study was approved by the Institutional Review Board (IRB) of the National Development and Research Institutes, Inc. Use of the data for the present study was approved by the Teachers College IRB.

Participants were recruited through two urban youth clinics. Flyers were posted clinic waiting rooms, and were given to youth by project staff. Participants were recruited individually, and were later asked to invite their partner to participate. If the individuals were initially interested, they either gave their phone number to the staff member, or called the number on the flyer. Follow-up calls were placed to determine eligibility. Individuals were eligible if: (a) they had been in a heterosexual dating relationship for at least 3 weeks (called a “main” relationship by researchers); (b) one member of the couple was between age 16 and 20; and (c) they had engaged in penile-vaginal or anal intercourse without a condom on at least one occasion with their present partner. If one individual member agreed to participate and was eligible after the follow-up call, that individual gave the phone number of their romantic partner to the staff member, who called the partner to tell them about the study. If both members of the couple met all criteria and agreed to participate, an appointment was made for the couple to visit the research facility. Participants were

informed that the study would take 2.5 to 3 hours, and that each couple member would receive \$50 for their participation.

A total of 293 youth were screened for eligibility. The primary reasons for not meeting eligibility criteria were: 53.9% were not involved in a relationship, 8.3% were not with a partner of the opposite sex, 13.1% had not engaged in penile/vaginal intercourse with the current partner, 14.9% reported using a condom at every sexual encounter with the present partner, 8.3% refused to participate with the current partner, and 2.2% cited other reasons for not participating.

Out of the 293 youth who were screened, 43 couples (86 youth) were eligible for participation. Of these 43 couples, 36 couples (72 youth) agreed to participate and came to the research facility. Out of these 36, two couples refused to be videotaped. Two additional couples could not be videotaped due to technical difficulties. Data is presented for the 32 (i.e., 64 participants) couples that completed the entire procedure.

### *Procedure*

*Couple Interviews and Observation.* Upon arrival at the research facility, couples were greeted by two researchers, who thoroughly explained the procedures and the purposes of the study. Couples were then given the opportunity to ask questions about the procedure, and provided signed informed consent. Each member of the couple then individually completed a computerized survey in a separate room from their partner. Next, the couple was brought together to complete a videotaped interaction task. After being videotaped, couple members were again placed in separate rooms, where they each completed individual assessments of their own and their partners' interpersonal behaviors during the videotaped

discussion. After this, couple members were debriefed individually. Detailed explanations of each element are described below.

*Phase 1: Computerized Survey.* An hour-long computerized survey was administered to each member of the couple separately. Surveys were conducted via Questionnaire Development System (QDS; Nova Research, 2006) on a laptop computer. Youth listened to each question via headphones as they read each question on the computer screen.

*Phase 2: Videotaped Interaction Task.* After completing the computerized survey, the couples were taken to a room with two chairs and video recording equipment. Couples were instructed that they would be asked to participate in two brief discussions that would be videotaped. For the first discussion (warm-up), couples were asked to plan a party together for 5 minutes. For the second discussion, couples were asked to discuss for 10 minutes the reasons they or couples they know did not use condoms consistently when engaging in sexual intercourse. Couples were also informed that if they ran out of things to say they could refer to a card that listed “some reasons couples like yourselves have told us they don’t use condoms consistently.” The researchers left the room but informed the couple that they would be able to see the couple via the monitor, but that they would not hear the couple’s discussion at that time and to wave their arms if they needed assistance. This procedure allowed researchers to keep an eye on the couple, while at the same time ensuring that they discussed the topic as candidly as possible. Snacks were provided throughout the videotaping sessions.

*Phase 3: Subjective assessment of interpersonal behaviors during the discussion task (Video Recall).* Couple members were placed in separate rooms, and each was provided with a laptop computer. Participants were shown the middle 5 minutes of their videotaped

discussion in 25-second intervals. Showing them the middle 5 minutes allowed for a warming up period the discussion, and buffered against variability in the length of couples' discussion. After each 25-second interval, the video automatically paused to allow participants to rate both themselves and their partner on 9 dimensions. After this procedure, couples were brought together and debriefed.

### *Validity Checks*

It was possible that the couples in this study were not actually romantically involved, but instead recruited a friend in order to receive the \$50 compensation. To determine whether couples were truly romantically involved, each videotape was examined for signs of intimacy. 31 out of 32 couples engaged in behaviors such as touching, discussing their sexual encounters, fighting, and flirting. All videos were viewed by at least ten research assistants, and only one couple was suspected of not being romantically involved because shared sexual activity was not discussed. See Appendix L for typical transcripts of three couples, demonstrating the typical amount of sexual content and familiarity that was displayed in the videos.

Another validity check concerned the content of the conversations. Because couples were given the option of discussing either their own condom use or the condom use of couples they knew, it was possible that they they would discuss others rather than themselves. It was also possible that they would discuss topics entirely unrelated to condom use. Again, an examination of transcripts and videotapes revealed that only one couple (the same one as above) did not discuss their own condom use during the conversation. All other couples spoke at some length about their own sexual habits, condom use frequency, and preferences with regard to condom use (for examples, see Appendix L). In addition

discussing their own condom use, couples often referenced related topics including the future of their relationship, substance use, and sexual activity of peers.

### *Measures*

#### *Measures from Phase 1 (computerized self-report survey).*

##### *Demographics and background characteristics*

Gender, race, educational status, socioeconomic status, sexual orientation, and sexual history were assessed using computerized self-report.

##### *Self-Reported Condom Use (CU)*

This variable was assessed via computerized self-report. Based upon the recommendations of Noar, Cole, and Carlyle (2006), participants were first asked to state the number of times they had engaged in intercourse with their current partner in the past month, and then the number of times they had used condoms in the past month with their current partner. Based on these responses, a proportion of times that a condom had been used was computed for each individual. The responses of couple members were moderately correlated, indicating moderately accurate reporting ( $r = .62$ ). Moderate differences in couple members' self-report is not surprising because self-reports of condom use are often inaccurate. Research participants often have difficulty remembering the frequency of intercourse or condom use when they occur often, resulting in a high number of "I don't know" or guessing responses (for a comprehensive discussion of difficulties measuring condom use, see Pisani, 2008). Additionally, 20% of the current sample reported having additional sexual partners besides their partner, possibly distorting their recollection of condom use with the "main" partner. Given the differences in self-reported condom use within couples, individuals' self-report of condom use in analyses, rather than averaging



together couple responses. The mean level of condom use did not differ by gender and was .33 for the entire sample ( $sd = .37$ ), which represents using condoms 33% of the time. This proportion is similar to other reports of high-risk couples' condom use (Fortenberry et al., 2002).

#### *Desire to use a condom (DC)*

This covariate was assessed via computerized self-report. Youth were first asked how recently they had had unprotected sex with this partner. They were asked to rate how much they wanted to use condoms on that occasion (responses ranged from 0 = not at all, to 10 = very much). They were then asked to how recently they used a condom with the current partner, and how much they wanted to use condoms on that occasion. For each individual, the most recent encounter was identified. The participant's desire to use a condom at their most recent sexual encounter as a single-item measure for this construct. The mean for the sample was 5.80 (3.19). Males and females did not differ in their desire to use a condom.

#### *Relational Uncertainty (RU)*

The Anxiety subscale of the Experiences in Close Relationships scale (ECR Anxiety Subscale; Brennan, Clark, & Shaver, 1998) was used to measure relational uncertainty. This scale has been used extensively in youth populations, and measures an individual's level of anxiety regarding the commitment level of their partner. It has been highly correlated with relational uncertainty among young adults (Knobloch, Solomon, & Cruz, 2001). Relational uncertainty and anxiety also correlate with similar characteristics such as depression (Knobloch & Knobloch-Fedders, 2010; Wei et al., 2005), heightened emotional response to interpersonal interactions (Gallo & Matthews, 2006; Knobloch & Solomon, 2005), and a pessimism bias regarding the evaluations of romantic partners (Knobloch et al., 2007;

Mikulciner, Shaver, & Pereg, 2003). The ECR Anxiety subscale is considered valid for use in this study because it has been used extensively in a wide range of sexually-active youth and young adult populations, including urban minority youth (e.g., Becker-Stoll, Delius, & Scheitenberger, 2001; Cooper, Shaver, & Collins, 1998; Strachman & Impett, 2009). The Anxiety subscale of the ECR consists of 14 items, each rated on a 1 (disagree strongly) to 7 (agree strongly) Likert scale. Items include: *I worry a lot about my relationships*, *I worry a fair amount about losing my partner*, and *I need a lot of reassurance that I am loved by my partner* (see Appendix A for complete list of items). In the present population, high internal consistency was found ( $\alpha = .87$ ). Items were averaged together to create a Relational Uncertainty score for each individual. High scores indicate low uncertainty, and low scores indicate high uncertainty. In the present sample, men and women did not differ with respect to their level of relational uncertainty. The mean level of relational uncertainty for the full sample was 3.87, which lies approximately at the midpoint of the scale. This indicates that both males and females reported a moderate amount of relational uncertainty.

Of note, attachment anxiety is often conceptualized as a trait-like characteristic of an individual, meaning that some individuals carry doubts about partner commitment into *all* of their relationships (Mikulciner & Shaver, 2007; Simpson, Collins, Tran, & Haydon, 2007). Conversely, researchers studying Relational Uncertainty *per se* generally treat this construct as relationship-specific; individuals may be uncertain about one relationship but not another. The current study takes the position it does not matter whether relational uncertainty is a stable characteristic of the individual, or whether it is specific to their current relationship. Relational uncertainty is expected to impact assertiveness in the same way, regardless of its origin.

### *Relationship Length (RL)*

This covariate was assessed by asking each participant how many months they had been in a relationship with their current partner. The length of relationships ranged from 1 to 72 months, with a mean of 16.44 months ( $sd = 15.53$ ), a median of 10 months, and a mode of 6 months. Partners were similar in their report of RL ( $r = .79, p = .00$ ). No gender differences were found.

### *Depression (DEP)*

This covariate was measured using the Center for Epidemiological Studies for Depression Scale 8-item version (CES-D 8; Jowell et al., 2007). This is a shortened version of the widely-used 20-item CES-D scale (Radloff, 1977) and has been validated as an indicator of depression for individuals 15 and older (van de Velde, Bracke, Levecque, & Meuleman, 2010). Participants are asked to rate their feelings in the preceding week using a scale ranging from 0 (none of the time) to 3 (all of the time). Questions assess happiness, restlessness, and other symptoms of depression (see Appendix B for full scale). In the present sample, reliability was high ( $alpha = .89$ ). Items were summed to create the total score, which ranged from 0 to 24. Higher scores indicate greater depression and scores above 7 are clinically significant. The mean for the entire sample was 6.64 ( $sd = 5.91$ ), suggesting substantial depression in the study sample. No gender differences were found.

### *Measures from Phase 3 (video recall of condom negotiation task)*

#### *Assertiveness during condom negotiation*

This study measures each participant's assertiveness using two raters. Using an Actor-Partner paradigm (Campbell & Kashy, 2002), each individual's assertiveness was rated by both themselves (the "actor") and by their own romantic partner (the "partner"). Two measures of

assertiveness were used for several reasons. First, using one rater to obtain data tends to result in inflated correlations between variables (Bank et al., 1990). Moreover, observational studies of romantic couples' interactions have found that youths' perceptions of their own behavior often differ from their partner's perception of their behavior, highlighting the importance of obtaining data from multiple raters (Welsh et al., 1998; Smith et al., 2010). Below are the two methods were used to measure assertiveness:

1. Self-reported assertiveness (AS1): As described above, couples were asked to discuss their condom use while being videotaped. After the discussion, a video-recall procedure was used to measure youths' feelings during the interaction (Welsh & Dickson, 2005). Participants independently viewed a video of their discussion. The video was paused every 20 seconds. At each interval, participants rated both themselves and their partners on 9 descriptive items (Welsh et al., 1999), with ratings ranging from 0 (not at all) to 4 (very much). Only 5 of the 9 items were administered to all study participants due to changes in procedure over the course of the study. For the actor ratings, a factor analysis was conducted of the 5 items, resulting in two factors (for the original 5 items and a detailed description of this factor analysis, please see Appendix C). One factor was comprised of the following three items: "I was trying to persuade my partner," "I was being conflictual," and "I was giving in to my partner." These three items are highly correlated ( $\alpha = .86$ ), so they were combined by taking the mean. Theoretically, these items assess the degree to which youth assertively negotiated with their partner, using both self-advocacy (conflict, persuasion) and compromise (giving in). Because romantic assertiveness often involves a balance of persuasion and compromise (Noom et al., 2001), these items were thought to accurately capture the construct of assertiveness during an intimate interaction. Higher scores represent higher levels of assertiveness.

2. Partner-reported assertiveness (AS2): Using the method described above, each partner's also rated the actor on the same 9 items, using a 0 to 4 scale. As stated above, only 5 of the 9 items were administered to all participants owing to changes in study protocol. A factor analysis of the items yielded a factor structure that was nearly identical to self-reported assertiveness (see Appendix D for details). The same three items loaded on to the same factor: "My partner was trying to persuade me," "my partner was giving in to me," and "my partner was being conflictual." The intercorrelations between these three items were adequate ( $\alpha = .79$ ), so they were averaged together. Together, these variables capture the degree to which one partner saw the actor visibly engaged in an assertive negotiation process. Higher scores represent higher levels of assertiveness.

#### *Data Analysis Plan*

Dyadic multilevel models were used to test each hypothesis. Preliminary analyses involved transforming variables to meet assumptions of normal distributions, and calculating zero-order correlations between variables. Following these preliminary analyses, each hypothesis will be discussed in a step-by-step manner. Principles of multilevel dyadic data analysis will be discussed, including the interpretation of fixed effects, random effects, and error terms. Following the guidelines set forth by Kenny and colleagues (2006), steps taken test each model will be presented: testing for nonindependence, assessing distinguishability of dyad members, checking model assumptions, and interpreting results. Post hoc analyses will then be discussed. These steps will be repeated for each hypothesis (for a similar format, see Butner, Diamond, & Hicks, 2007). All analyses were run using SPSS version 20.0 (IBM, 2011). A discussion will follow the results.

## CHAPTER 3

### **Results**

#### *Demographics and background information*

The mean age of males and females were 19.79 and 18.97 years, respectively. 45.3% (N = 29) were African-American (not Hispanic), 32.8% (N = 21) were Hispanic, and 12.5% (N = 8) were both African-American and Hispanic (see Table 1). The remaining 9.3% of participants were of other races. When asked to qualitatively describe their racial/ethnic background, those who identified as “other” generally described themselves as a blend of Caribbean, European, and African ancestry such as “Puerto-Rican/Italian,” “Spanish/French/African,” and “Haitian/Italian”. 45.5% (N = 29) were currently enrolled in school, and an additional 21% (N= 14) were working on their GED. In terms of sexual history, females and males reported an average of 5.81 and 13.84 lifetime opposite-sex sexual partners, respectively. The large number of males’ reported partners may be influenced by males’ consistent tendency to over-report sexual partnering (Brewer et al., 2000). Of note, 21% (N=14) of the present sample reported having at least one additional sexual partner while involved with their current partner. 17.2 % (N = 11) of the sample reported having been infected with an STI in the past 12 months. 6 of those participants reported having more than 1 STI in the past 12 months. One individual reported being infected with HIV. 83.3% (N = 53) of the sample reported being tested for HIV in the previous year, but this was likely due to the fact that they were recruited a clinic that promoted free HIV testing. The percentage of the sample reporting that had ever tried

various drugs was as follows: cigarettes, 81.3%; alcohol, 98.4%; marijuana, 89%; cocaine, 1.5%; hallucinogens, 4.7%; other drugs, 19%. No participants reported ever injecting drugs.

Table 1  
*Sample characteristics*

Characteristic	Total (N=64)	Males (N=32)	Females (N=32)
Age	18.96 (2.70)	19.79 (2.97)	18.97 (2.11)
<b>Racial/Ethnic Background</b>			
African-American (not Hispanic)	29 (45.3%)	16 (50%)	13 (40.1%)
Hispanic	21 (32.8%)	10 (31.3%)	11 (34.4%)
African-American and Hispanic	8 (12.5%)	4 (12.5%)	4 (12.5%)
Other	6 (9.3%)	2 (6.3%)	4 (12.5%)
<b>Educational History</b>			
Currently enrolled in school	29 (45.3%)	12 (33.3%)	17 (53.1%)
Working on GED	14 (21%)	7 (19.4%)	7 (19.4%)
<b>Sexual History</b>			
Lifetime opposite-sex partners	7.68 (13.55)	15.65 (20.74)	6.22 (9.14)
Reported having multiple sexual partners while involved with the current partner	14 (21%)	6 (18.7%)	8 (25%)
Infected with STI in past 12 months	11 (17.2%)	4 (12.5%)	7 (21.9%)
Tested for HIV in the past 12 months	53 (83.8%)	27 (84.4%)	26 (81.3%)
Ever tested positive for HIV	1 (1.6%)	1 (3.1%)	0
<b>Lifetime prevalence of drug and alcohol use</b>			
Cigarettes	52 (81.3%)	26 (81.2%)	26 (81.2%)
Alcohol	63 (98.4%)	32 (100%)	31 (96.9%)
Marijuana	51 (89%)	26 (81.2%)	25 (78.1%)
Hallucinogens	3 (4.7%)	1 (3.1%)	2 (6.3%)
Cocaine	1 (1.5%)	0	1 (3.1%)
Inhalants	2 (3.1%)	1 (3.1%)	1 (3.1%)
Pills	5 (7.8%)	3 (1%)	2 (6.3%)
Oxycontin	1 (1.5%)	0	1 (3.1%)
Club Drugs	4 (6.3%)	0	4 (12.5%)
Heroin, Crack	0	0	0

### *Data Preparation*

In order for regression analyses to produce unbiased estimates, continuous dependent and independent variables should be normally distributed. The raw data in the current study was not completely normally distributed, a situation that is common among social science research (Micceri, 1989). In the following section, efforts to normalize each continuous variable are described. Histograms of raw data are shown in Figure 4. The exact process used to examine each variable and decide upon transformations is detailed in Appendix E.

*Condom Use (CU):* As seen in figure 4, CU was somewhat bimodal, having both floor and ceiling effects. While kurtosis was within normal limits, CU failed all other tests of normality. It could not be transformed to approximate a normal distribution. Dichotomizing this variable was considered. However, dichotomizing this variable would have interfered with the theoretical underpinnings of the research questions. Instead, the decision was made to analyze CU as a continuous variable despite the violation of normality.

*Desire to use a condom (DC):* A histogram of the raw data did not appear normal. Additionally, Shapiro-Wilk and Kolomogorov tests were significant, suggesting that this variable is not significantly distributed in the population from which the sample was drawn. No transformations were successful in approximating a normal distribution. For this reason, DC was dichotomized into those who wanted to use a condom at the most recent sexual encounter (coded “1”), and those who did not (coded “0”). Because this variable was a covariate, losing variability due to dichotomization was not a major concern. 14 individuals did not want to use a condom at all, whereas 50 participants reported experiencing some desire to use a condom at most recent intercourse. Of note, couple members were compared on their desire to use a condom. Only one



couple in the study had two partners who both had “0” desire to use a condom. All other couples contained at least one partner who reported some desire to use a condom at the most recent encounter.

*Relational Uncertainty (RU)*: Raw data showed skew and kurtosis within normal limits, but both Shapiro-Wilk and Kolomogorov tests were significant. This variable was raised to the 1/2 power, resulting in a reasonably normal distribution.

*Self-reported assertiveness (AS1)*: Although the Shapiro-Wilk test was significant for this variable, all other indicators suggested a reasonably normal distribution. No transformations were performed.

*Partner-reported assertiveness (AS2)*: The Shapiro-Wilk test was significant, and the histogram appeared positively skewed. However, no transformations were successful in approximating a normal distribution. Because raw data was relatively normal, it was analyzed without transformations.

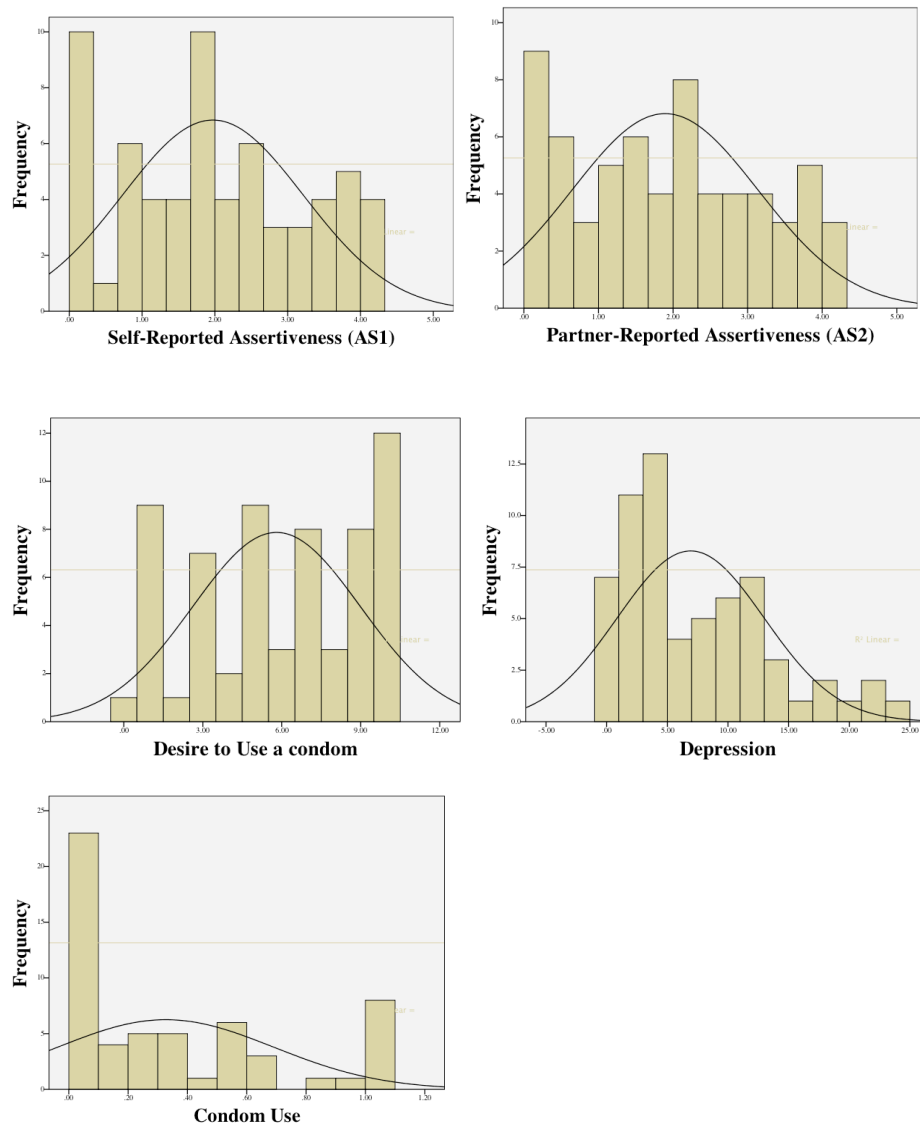
*Relationship Length (RL)*: This variable was highly skewed and both Shapiro-Wilk and Kolomogorov tests were significant. This variable was transformed by taking the log10 of each value. The resulting distribution passed all tests of normality.

*Depression (DEP)*: Raw data was highly skewed and both Shapiro-Wilk and Kolomogorov tests were significant. This variable was raised to the 1/3 power (i.e.,  $DEP^{1/3}$ ), which resulted in a more normal distribution. Although the Wilk-Shapiro test was still significant, all other indicators were within normal limits.

#### *Zero-Order Correlations*

Zero-order correlations between study variables were run separately for each gender and are presented in Table 2. Results were similar for each gender. Youth who desired to use a

Figure 4  
Distributions of raw data for all study variables.



condom were somewhat more likely to use them ( $r = .49$  and  $.53$  for boys and girls, respectively;  $p < .01$  for both genders). However, as Bauman and colleagues (2007) point out, correlations of this magnitude account for only 24-28% of the variance in actual condom use, necessitating a greater understanding of other sources of variance in condom use. Regarding the other study variables, relational uncertainty only correlated with depression. Those with higher relational uncertainty were also more depressed; this correlation was more pronounced in boys ( $r = .64$ ,  $p <$

Table 2

*Zero-order correlations between all study variables, separated by gender. Females are above the diagonal; males are below the diagonal.*

Variable	1	2	3	4	5	6	7
1. Proportion of sex acts with condom (CU)	---	0.19	-.32 <sup>+</sup>	-0.5	0.13	.53**	-0.7
2. Self-reported assertiveness (AS1)	-0.01	---	0.25	.39*	-0.01	-0.25	0.00
3. Partner-reported assertiveness (AS2)	0.00	.29 <sup>+</sup>	---	0.07	-0.11	-.30 <sup>+</sup>	0.08
4. Depression (DEP)	0.11	-0.13	0.13	---	0.31	0.06	.45**
5. Relationship length in months (RL)	0.06	-.31 <sup>+</sup>	-0.15	0.07	---	0.21	0.14
6. Desire to use a condom (DC)	.49**	-0.11	0.05	0.05	0.15	---	0.08
7. Relational Uncertainty (RU)	0.13	0.10	0.20	.64**	0.03	0.04	---

<sup>+</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

.01) than in girls ( $r = .45, p < .01$ ). Regarding the assertiveness variables, unexpected associations emerged. For girls, higher depression was related to higher self-reported assertiveness ( $r = .39, p < .05$ ); no relationship was found in boys. Girls whose partners rated them as highly assertive were marginally less likely to desire condom use ( $r = -.30, p < .10$ ) and used condoms marginally less often ( $r = -.32, p < .10$ ). For boys, longer relationships were associated marginally lower levels of self-reported assertiveness ( $r = -.31, p < .10$ ). Girls were more accurate than boys at gauging their partner's level of assertiveness; their ratings of their partner were marginally associated with their partner's ratings of themselves ( $r = .29, p < .10$ ). Boys' ratings of their girlfriends did not correlate with their girlfriends' ratings of themselves.

### **Hypothesis 1: Model Structure**

#### *Analyzing Dyadic Data*

Dyadic data, such as data from romantic couples, requires special statistical methods. Most traditional statistical tests are based on the assumption that observations are independent of one another—that is, each participant was randomly sampled from a give

population. When studying romantic couples, this assumption is violated. Not only are couple members linked to one another by shared history and mutual interests, they also interact with one another over the course of the study procedure. Therefore, it may be said that dyadic data is “nonindependent.” When studying dyads, it is necessary to control for this nonindependence in order to obtain unbiased variance estimates. The amount of variance shared by couple members is quantified and removed from the overall sample variance, resulting in more accurate statistical inference (Kenny, et al., 2006).

Dyadic data can be analyzed using ANOVA, structural equation modeling, and multilevel modeling, but multilevel modeling is most widely used (Kenny, et al., 2006). Although multilevel modeling can be conceptualized in several ways, Bryk and Raudenbush (1987) set forth a conceptual framework that extends an ordinary multiple regression model to a multilevel model. Their framework models a dependent variable using two “levels” of regression models. This will be illustrated using hypothesis 1, in which condom use (CU) is the dependent term, and the two types of assertion are the independent terms. For the sake of simplicity in this example, only one type of assertion will be used as the predictor (AS). Covariates will also be excluded from this example. The first regression model (Level 1) is a traditional regression model containing an intercept, one or more slopes, and an error term.

That is,

$$(1) \quad \text{Level 1:} \quad CU_i = \beta_{0d} + \beta_1(AS_i) + r_i.$$

This equation is a simple regression model for Subject  $i$ 's outcome on CU. In this equation, CU is modeled using an intercept ( $\beta_{0d}$ ) and slope ( $\beta_1$ ). The only independent variable in the model is the participant's AS. The error term  $r_i$  quantifies the distance between Subject  $i$ 's actual and predicted scores on variable AS. The less error that remains, the more accurately the model has predicted CU.

The equation shown above may seem complete. However, when this model is estimated using maximum likelihood estimation, an important assumption is violated—as stated above, the participants in the study are not independent of one another (Kenny, 1996). Instead, they are “nested” within couples, and their condom use and level of assertiveness are likely to covary with those of their partner. For example, a romantic partnership may have developed between two individuals due to similar communication styles such as assertiveness. One partner’s assertiveness may have led the other partner to become more or less assertive over the course of their shared history. Additionally, individuals with strong convictions about condom use and strong condom-use habits may also be drawn to one another. The two members of a dyad are therefore expected to be more similar to each other than they are to other study participants, violating the independence assumption. To correct for the shared variance between couple members, another “level” of regression model is therefore added “below” the one shown above. Level 2 is used to predict the two regression coefficients that will be used in the level 1 equation (1). Level 2 consists of two equations, one predicting each of the regression coefficients in Level 1:

$$(2) \quad \text{Level 2:} \quad \beta_{0d} = \gamma_{00} + u_{0d}$$

$$\beta_{1i} = \gamma_{10}$$

The first equation’s outcome variable is  $\beta_{0d}$ , which is the intercept of the Level-1 equation. This intercept is predicted using two terms:  $\gamma_{10}$ , which is the level of CU when all predictors are held equal to zero (the grand mean of CU across the sample), and the error term  $u_{0d}$ , which is the degree to which individual  $i$ ’s dyad mean deviates from its predicted value (i.e., that couple’s deviation from the grand mean). Therefore, each dyad is allowed to have its own CU intercept in the Level-1 equation. The second equation’s outcome variable is  $\beta_{1i}$ , which is the slope of the Level-1 equation. This slope is based on only one term--  $\gamma_{00}$ —

which represents the degree to which AS impacts CU for the entire sample. The Level-2 equation for  $\beta_{1i}$  has no error term, which means that the impact of AS on CU is expected to be the same for all couples. This concept will be explained in detail below.

*Data analysis plan for Hypothesis 1*

To test the first hypothesis, the basic model above was extended to include several predictor variables: two assertiveness variables (AS1 = actor's self-report of assertiveness during interaction, AS2 = partner's report of actor's assertiveness during interaction), and three covariates: relationship length (RL), depression (DEP), and gender (G). When controlling for gender, it was also necessary to control for the possibility that the effect of each predictor and covariate differed by gender; interaction terms were therefore added to the model (Kenny et al. 2006). Although the resulting model contains numerous terms, nonsignificant terms were trimmed in the final analysis, as will be discussed below (for an example of a multilevel model with gender interaction terms that are subsequently removed from the model, see Campbell et al., 2005). The Level-1 and Level-2 models for the complete equation are shown below:

$$(3) \quad \text{Level 1:} \quad \text{CU}_{di} = \beta_{0d} + \beta_1(\text{AS1}_i) + \beta_2(\text{AS2}_i) + \beta_3(\text{RL}_i) + \beta_4(\text{DEP}_i) + \beta_5(\text{DC}_i) + \beta_6(\text{G}_i) + \beta_7(\text{G}_i * \text{AS1}_i) + \beta_8(\text{G}_i * \text{AS2}_i) + \beta_9(\text{G}_i * \text{RL}_i) + \beta_{10}(\text{G}_i * \text{DEP}_i) + \beta_{11}(\text{G}_i * \text{DC}_i) + r_{i0}$$

Level 2:	$\beta_{0d} = \gamma_{00} + u_{0d}$	$\beta_6 = \gamma_{60}$
	$\beta_1 = \gamma_{10}$	$\beta_7 = \gamma_{70}$
	$\beta_2 = \gamma_{20}$	$\beta_8 = \gamma_{80}$
	$\beta_3 = \gamma_{30}$	$\beta_9 = \gamma_{90}$
	$\beta_4 = \gamma_{40}$	$\beta_{10} = \gamma_{100}$
	$\beta_5 = \gamma_{50}$	$\beta_{11} = \gamma_{110}$

Explanations for each term in the model are as follows:

$CU_{di}$  = the value of CU for individual  $i$  in dyad  $d$ .

$\beta_{0d}$  = average CU level for individual  $i$  in dyad  $d$  when all Level-1 predictors are held equal to zero.

$\gamma_{00}$  = the average CU score across the entire sample, when all assertiveness factors, RL, and DC are equal to zero. This is the predicted intercept when all predictors are held equal to zero.

$u_{0d}$  = the degree to which the intercept for dyad  $d$  differs from the predicted intercept ( $\beta_{0d}$ ) when all predictors are held equal to zero.

$\beta_1$  and  $\gamma_{10}$  = maximum likelihood estimate of the average difference in CU for a 1-unit increase in individual  $i$ 's AS1. This parameter represents a primary research question. A significant main effect indicates that an individual's assertiveness, as measured by survey self-report, significantly predicts their level of condom use when all other variables are held constant.

$\beta_2$  and  $\gamma_{20}$  = maximum likelihood estimate of the average difference in CU for a 1-unit increase in individual  $i$ 's AS2. This parameter represents a primary research question. A significant main effect indicates that an individual's assertiveness, as measured by the observations of a trained observer, significantly predicts their level of condom use when all other variables are held constant.

$\beta_3$  and  $\gamma_{30}$  = maximum likelihood estimate of the average difference in CU for a 1-unit increase in individual  $i$ 's RL. This parameter is a covariate and is meant to remove variance in CU that is associated with RL. A significant main effect indicates that an individual's length of relationship significantly predicts their level of condom use when all other variables are held constant.

$\beta_4$  and  $\gamma_{40}$  = maximum likelihood estimate of the average difference in CU for a 1-unit increase in individual  $i$ 's DEP. This parameter is a covariate and is meant to remove variance in CU that is associated with DC. A significant main effect indicates that an individual's level of depression predicts their level of condom use when all other variables are held constant.

$\beta_5$  and  $\gamma_{50}$  = the degree to which CU differs between participants who reported wanting to use condoms, and those who did not. A significant term indicates that there are mean-level differences in the proportions of condoms used by each of these groups, when all other variables are held constant.

$\beta_6$  and  $\gamma_{60}$  = the degree to which CU differs in males and females. A significant term indicates that there are mean-level differences in the CU of each gender.

$\beta_7$  and  $\gamma_{70}$  = the degree to which the effect of AS1 on CU differs by gender.

$\beta_8$  and  $\gamma_{80}$  = the degree to which the effect of AS2 on CU differs by gender.

$\beta_9$  and  $\gamma_{90}$  = the degree to which the effect of RL on CU differs by gender.

$\beta_{10}$  and  $\gamma_{100}$  = the degree to which the effect of DEP on CU differs by gender.

$\beta_{11}$  and  $\gamma_{110}$  = the degree to which the effect of DC on CU differs by gender.

$r_i$  = the degree to which an individual's score differs from their predicted score (i.e., variance that is unexplained by the full model).

### *Random and Fixed Effects in Dyadic Analysis*

In the equations above, Level 1 is simply a multiple regression that includes predictors, covariates, and interaction terms. The intercept ( $\beta_{0d}$ ) is allowed to differ in each couple. In Level 2,  $\beta_1$  through  $\beta_{11}$  are equal to their Level-2 counterparts,  $\gamma_{10}$  through  $\gamma_{110}$ . This means that the effects of AS1, AS2, RL, DEP, DC, and G are constrained to be equal across all dyads—there are no error components in these equations. This concept requires some explanation. In dyadic models, only one Level-2 equation may contain an error term (Kenny, et al., 2006). This is mandated for two reasons-- one is statistical and the other is theoretical. Regarding statistical rationale, dyads only have two members. In order for a statistical model to be uniquely identified using maximum likelihood estimation, the number of parameters and that are allowed to vary must be constrained based upon the number of measured variables. Because the degrees of freedom for any model are approximately  $n-1$ , a Level-2 model with two members per dyad allows only one parameter to vary (i.e.,  $2-1 = 1$ ). In most dyadic models, the intercept is the parameter that is allowed to vary. In this study, for example, the intercept ( $\beta_{0d}$ ), is a specific level of CU, and is different for each dyad. Therefore, it contains an error term that allows each dyad to differ (i.e., it is called a “random” effect).  $\beta_1$ , on the other hand, represents the degree to which self-reported assertiveness (AS1) impacts condom use (CU) across the entire sample. Because there is no error component, the impact of AS1 on CU is constrained to be the same for all couples (i.e., they are “fixed” effects). Theoretically, it also makes sense that the intercept, but not the slopes, is allowed to vary by couple. The intercept represents the level of condom use, which is presumably different across couples. Because there is no reason to assume that couples are similar in their levels of condom use, the intercept is allowed to vary. However, the slopes



represent the *correlation* between assertiveness and condom use. A positive correlation is expected to exist for all individuals in the study, regardless of which couple they belong to. Therefore, there is no reason to believe that this slope should vary from couple to couple. Likewise, the predictive value of relationship length, depression, desire to use condom, and gender were expected to be the same for the all participants, regardless of couple membership. Therefore, the slopes were “fixed”, which means that they do *not* have error terms in the level-2 equations. The intercept was “random”, which means that it *does* have an error term in its level-2 equation.

Although the error terms are a complex concept, they are the primary way that multilevel models allow for nonindependent participants. Multilevel models differ from ordinary regression models by including more than one error term. In the model described above, there are two error terms—one that describes the variation of individual’s CU around their predicted value ( $r_i$ ), and one that describes the variation of couples’ CU around the average intercept ( $u_{0d}$ ). If couples are conceptualized as very small “groups,” the multilevel model can be easily conceptualized as a traditional ANOVA. The  $r_i$  error term is roughly analogous to “within-group variability,” and the  $u_{0d}$  error term is analogous to “between-group variability.” The latter error term allows individuals to be nested within couples, or “groups.” By combining methods from both regression and ANOVA, the multilevel model is therefore able to capture variability due to couple, or “group” membership ( $u_{0d}$ ), and to simultaneously make predictions based upon individual-level continuous predictors, such as assertiveness.

### *Centering Predictors and Covariates*

Following the recommendations of Kenny and colleagues (2006), predictor variables and covariates in the model were centered such that zero became a meaningful value. The grand mean of each type of assertiveness was found for the full sample, and was subtracted from each individual's score to create centered scores. Zero therefore represents the mean level of AS1 and AS2 for the entire sample. Assertiveness scores were centered around the entire sample mean rather than the couple mean because the primary research question involves assertiveness in general, rather than assertiveness as it relates to the partner's characteristics (for an example of grand mean centering of relational variables in a dyadic model, see Impett, et al., 2008). Each continuous covariate was also centered around its grand mean, while categorical covariates (Gender and DC) were coded as "0" or "1".

The MIXED procedure in SPSS version 20.0 was used for all analyses (IBM, 2011; see Appendix I for syntax). The MIXED procedure allows for multilevel models in which units at one level of measurement (individuals) are nested within another unit of measurement (dyads). Restricted maximum likelihood estimation (REML) was used (see Singer & Willett, 2003, p. 87-90).

### *Preliminary Analyses for Hypothesis 1*

Dyadic hierarchical linear models invoke numerous assumptions. Testing these assumptions required a number of steps. Like other regression models, all continuous variables were assumed to be normally distributed. As stated above, variables were examined for normality and transformed when possible. Other preliminary tests of assumptions are described below.

*Test of nonindependence.* Dyadic data analysis assumes that couple members' ratings are "nonindependent", meaning each participant's scores correlate with their partner's scores. The Interclass Correlation Coefficient was used to determine whether couple members' scores were correlated (ICC, i.e., a simple bivariate correlation between two partners' scores). As suggested by Kenny and colleagues (2006), the alpha level for these correlations was set at .20 (two-tailed). Partners were independent on several measures (AS1, RU, and DC). Moderate correlations were found between couple members on the following variables: each partner's rating of the other's assertiveness (AS2;  $r = .30$ ;  $p = .091$ ) and depression (DEP;  $r = .36$ ;  $p = .04$ ). Variables that were highly correlated between couple members were: proportion of times condoms used (CU;  $r = .62$ ;  $p = .00$ ), ratings of relationship length (RL;  $r = .79$ ;  $p = .00$ ). The large number of correlations between couple members supported a need for dyadic data analysis strategies.

*Assessing distinguishability of dyad members.* When members of a dyad are of different genders it may or may not be necessary to distinguish between genders when building multilevel models. According to Kenny and colleagues (2006), two conditions must be met in order to treat genders as being indistinguishable. First, their mean scores on the outcome variable (CU) must not differ significantly. Paired samples t-tests showed that this condition was met ( $t(55) = 6.36$ ,  $p = .53$ ). The second step is to determine whether males and females have similar variance structures on each outcome variable. This was tested using two methods, as described in Appendix F. Analyses showed that males and females did not differ in their CU variance structures. Although these analyses indicated it was not necessary to distinguish between gender, previous research has found gender differences relational and sexual goals (Schmitt, 2006), condom use patterns (Eaton et al., 2011), and

socialized gender roles (Jack & Dill, 1992). It was therefore considered prudent to include gender as a covariate in the current analysis, as it could be removed if it was not significant.

### *Building the final model*

After the preliminary analyses had been completed, the actual model was run in a series of steps. As suggested by Heck, Thomas, & Tobatta (2010), the first model contained only the random intercept as a predictor. Results showed that the intercept was significant ( $Wald Z = 2.224, p = .01$ ), meaning that couples significantly differed in their mean levels of condom use. The random intercept was therefore retained in the model. All predictors, covariates, and interaction terms were then added as fixed effects. Length of relationship was not a significant predictor, and was removed from the equation. The interaction between gender and desire to use a condom was also nonsignificant, and was removed. The other interactions did not reach significance, but when they were removed, the main effects no longer reached significance. The interactions were therefore retained in the model. The final model is shown in Table 2. The final SPSS syntax is shown in Appendix H.

### *Checking Model Assumptions*

After running the final model, techniques described by Singer and Willett (2003) were used to determine whether the model violated its assumptions (see Appendix K). Level-1 standardized residuals did not approximate a normal distribution, which violated assumptions of normality. Regarding the assumption of homoscedascity, residuals were equally distributed around predictor AS1 but not predictor AS2. Overall, this model was in moderate violations of its assumptions, possibly due to the skewed outcome variable. Raudenbush & Bryk (2002) suggest calculating robust standard errors to correct for

Table 3  
*Multilevel Model Predicting Condom Use (Hypothesis 1)*

Parameter	Unstandardized HLM Coefficient	Standard Error	Effect size
Intercept ( $\beta_{0d}$ )	0.15	0.09	
Self-reported assertiveness (AS1; $\beta_1$ )	0.13*	0.06	0.57
Partner-reported assertiveness (AS2; $\beta_2$ )	-0.11*	0.05	0.50
Depression (DEP; $\beta_4$ )	-0.23+	0.13	0.50
Desire to use condom (DC; $\beta_5$ )	0.21*	0.10	0.53
Gender (G; $\beta_6$ )	0.04	0.08	
AS1*Gender ( $\beta_7$ )	-0.12	0.09	
AS2*Gender ( $\beta_8$ )	0.10	0.08	
DEP*Gender ( $\beta_{10}$ )	0.19	0.17	

*Note.* Gender is coded 1 for women and 0 for men; Desire to use condom is coded 1 for yes, 0 for no. All predictors are grand-mean centered.

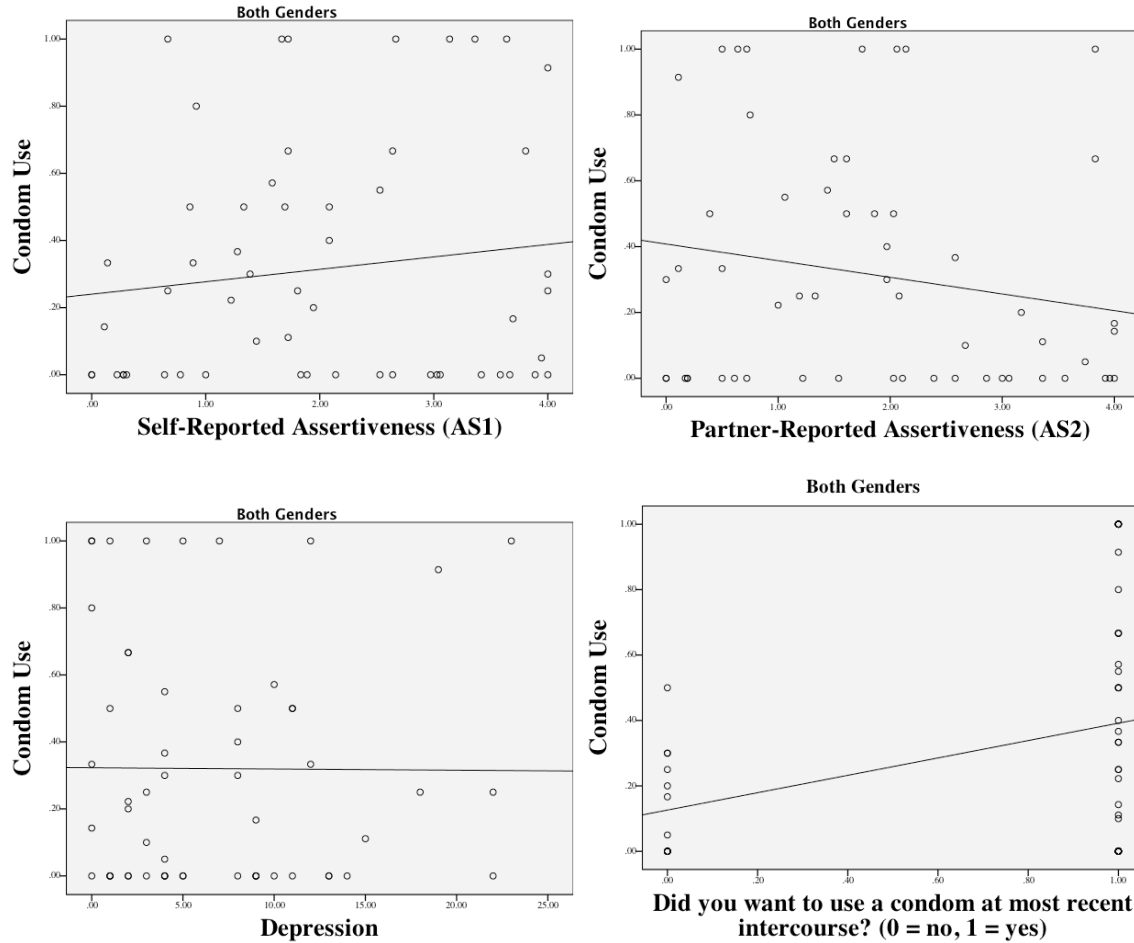
+ $p$  .10. \* $p$  .05. \*\* $p$  .01. \*\*\* $p$  .001.

violations of model assumptions. However, these standard errors are not available SPSS v.20. These results should therefore be interpreted with caution.

### ***Results of data analysis***

Hypothesis 1 determined the extent to which two measures of assertiveness during condom negotiation predicted actual condom use (CU). Scatterplots of significant results are presented in Figure 5, and results are seen in Table 3. Regarding the primary research questions, both types of assertiveness significantly predicted condom use, even after covariates had been controlled. Consistent with hypotheses, self-reported assertiveness (AS1) during condom negotiation was positively correlated with actual condom use in both genders ( $t(42.89) = 2.481, p = .02$ ). This correlation accounted for very little variance ( $B = .13$ ), but the effect size was moderate ( $d = .57$ ), possibly due to the low likelihood of finding such a small significant correlation in a small sample. This finding supports the hypothesis that higher assertiveness during condom negotiation is associated with greater condom use.

Figure 5  
Scatterplots of correlations in Hypothesis 1.



Contrary to this finding, however, partner-reported assertiveness (AS2) was *inversely* correlated with condom use for both genders ( $t(39.504) = -2.208, p = .03$ ). The amount of variance accounted for by AS2 was small ( $B = .11$ ), but the effect size was also moderate ( $d = .50$ ). Participants who behaved assertively in the eyes of their partner showed somewhat lower levels of condom use. Conversely, those who were rated as less assertive were somewhat more likely to use condoms. Post-hoc analyses were conducted to clarify these findings (see below).

Regarding the other variables in the model, depression showed a small, marginally significant inverse correlation with condom use, indicating that higher depression was related

to lower condom use ( $t(39.979) = -1.726, p = .09; d = .50$ ). Although this correlation is not evident in the examination of the scatterplot (Figure 5), this may have been due to the interaction between depression and gender. Although the interaction was not significant, zero-order correlations show that the association differed by gender. While depressed men tended to use condoms more often ( $r = .11, n/s$ ), depressed women tended to use condoms less often ( $r = .50, n/s$ ). These trends, however, did not reach significance.

Participants' desire to use a condom also significantly predicted condom use ( $t(38.979) = 1.726; p = .05$ ). The effect size was moderate ( $d = .53$ ). This variable was categorical, with those who reported never wanting to use a condom with their current partner as 0, and all others as 1. The scatterplot in Figure 5 illustrates these groups. Participants who did not want to use condoms were unlikely to use them. However, there was a great deal of variability among those who *did* want to use condoms. This finding illustrates that many youth want to use condoms, but that this does not translate directly into actual use.

#### *Post-hoc analyses for Hypothesis 1*

*Clarification of AS2:* AS1 and AS2 were expected to measure similar constructs. However, a zero-order correlation between these variables was small ( $r = .26; p = .04$ ), and their correlations with condom use ran in opposite directions. It is therefore likely that these variables measured different constructs. Unplanned post-hoc analyses were used to explore possible explanations for unexpected results. Post-hoc correlational analyses revealed that each participant's AS1 was highly correlated with the way that they rated their *partner's* assertiveness (i.e., their partner's AS2). This correlation was nearly perfect ( $r = .97, p = .00$ ). This surprising finding indicates that AS2 could not be considered an accurate measure of

*actor's* assertive behavior, but was instead considered a reflection of their *partner's* assertiveness. The accuracy of each individual's ratings of their partner was also calculated (i.e., actor's rating of their partner versus the partner's rating of themselves). This correlation was small and only moderately neared significance ( $r = .20$ ;  $p = .12$ ), suggesting that youths' ratings of their partners were generally inaccurate. The question arises whether each individual projected their own behavior onto their partner, or whether they projected their partner's behavior onto themselves. During the video-recall procedure, each participant was asked to rate themselves first, and their partner second. It is therefore likely that participants projected their own behavior onto their partner, rather than the other way around. Overall, these post-hoc analyses suggest that (a) each youth interpreted their partner's behavior as being similar to their own, and (b) each partner experienced a substantively different level of assertiveness in the conversation.

*Interaction between AS1 and AS2:* Because AS1 and AS2 had opposite effects on condom use, exploratory post-hoc multilevel models were run to disentangle this relationship. AS2 was replaced with the partner's AS1 (i.e.,  $AS1_{\text{partner}}$ ), as these two variables were nearly perfectly correlated. An interaction term between actor and partner's assertiveness was added ( $AS1_{\text{actor}} * AS1_{\text{partner}}$ ). Guidelines by Campbell and Kenny (203) were used in constructing this interaction term. Non-centered variables were used, and 1 was added to each value to prevent multiplication by zero. The results are presented in Table 4 (below). Covariates were not significant and were removed from the model. Model checks revealed mild deviation from assumptions, as was seen in the previous model. The interaction between actor and partner's assertiveness reached significance and had a



Table 4

Post-hoc multilevel model predicting CU. This model includes the interaction between actor and partners' self-reported assertiveness

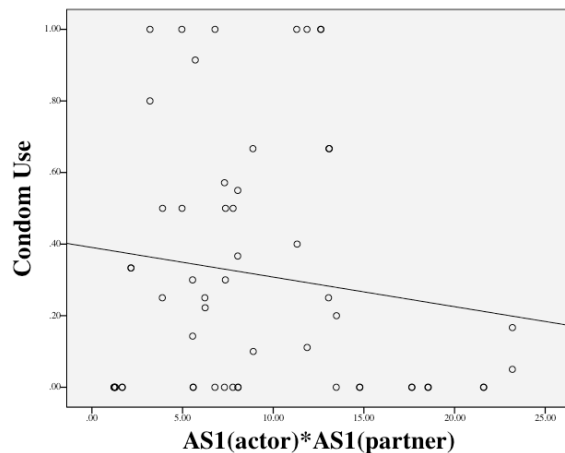
Predictor	Unstandardized HLM Coefficient	Standard Error	Effect size
Intercept ( $\beta_{0d}$ )	-0.31	0.29	
Self-reported assertiveness ( $AS1_{actor}$ )	0.27**	0.09	0.73
Partner's self-reported assertiveness ( $AS1_{partner}$ )	.18+	0.09	0.49
Gender (G; $\beta_6$ )	0.08	0.06	
$(AS1_{actor}) * (AS1_{partner})$	-.08*	0.03	0.68

Note: Gender is coded 1 for women and 0 for men. Predictors are *not* grand-mean centered.

+ $p$  .10. \* $p$  .05. \*\* $p$  .01. \*\*\* $p$  .001.

Figure 6

Post-hoc scatterplot illustrating the interaction between  $AS1_{actor}$  and  $AS1_{partner}$ , and its association on the actor's condom use.



moderate effect size ( $t(25.874) = -2.708, p = .01, d = .68$ ). An illustration of this interaction is shown in Figure 6. As the overall level of assertiveness increases in both partners, condom use decreases. The scatterplot in Figure 6 strongly suggested a curvilinear relationship between condom use and A quadratic term was entered into the model to test for a curvilinear relationship, but it was not significant.

*Sum of actor and partner ASI:* Despite the findings in the previous model, the relationship between actor and partners' ASI remained unclear. Examination of Figure 6

strongly suggested the existence of a curvilinear relationship between condom use and the overall level of assertiveness in a couple. Furthermore, it is theoretically plausible that this curvilinear relationship exists. As stated above, assertiveness involves a balance of self-advocacy and compromise (Noom et al., 2001). It is therefore possible that couples showing the middle-range of assertiveness are best able to negotiate condom use, while couples with too much or too little assertiveness do not achieve this balance. Additional tests were performed to examine this relationship.

Although the curvilinear relationship was not significant using a simple multiplicative interaction (i.e.,  $AS1_{actor} * AS1_{partner}$ ), Kenny and colleagues (2006) point out that “multiplying is just one of an infinite number of ways to specify an interaction between two continuous variables” (p. 150). Following their guidelines, the total amount of assertiveness in each couple was calculated by simply adding the two partner’s AS1 ratings together ( $AS1_{actor} + AS1_{partner}$ ). This new variable represented the total amount of assertiveness in a couple’s interaction, and was termed “ $AS1_{sum}$ ”. A new dyadic model was constructed to include all the following predictors and covariates:  $AS1_{actor}$ ,  $AS1_{partner}$ , DEP, DC, RL, GENDER, and  $AS1_{sum}$ . Additionally, a curvilinear trend was tested for  $AS1_{sum}$  by including the term  $AS1_{sum} * AS1_{sum}$ . Nonsignificant terms were pruned from the model. An analysis of residuals showed that this model mildly deviated from model assumptions.

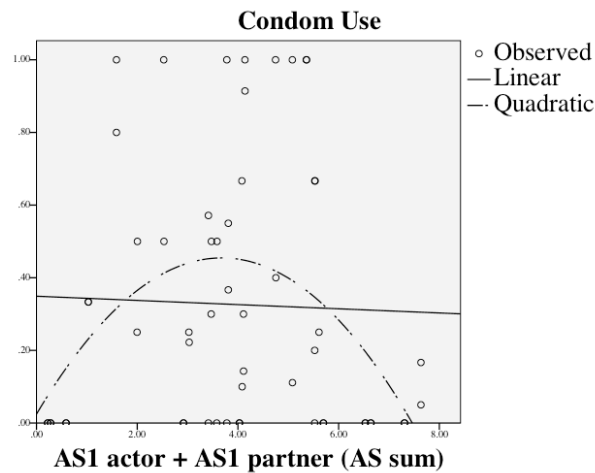
The final model is shown in Table 5. None of the covariates were significant. The curvilinear term, however, was significant and showed a moderate effect size ( $t(25.83) = -2.645, p = .01, d = .66$ ). As seen in Figure 7,  $AS1_{sum}$  predicted condom use in a curvilinear manner. Couples with low assertiveness showed low condom use, and those with high moderate levels of assertiveness showed the widest range of condom use. This suggests that

Table 5  
*Post-hoc multilevel model predicting CU. This model tests for a curvilinear relationship between  $ASI_{sum}$  and condom use*

Predictor	Unstandardized HLM Coefficient	Standard Error	Effect size
Intercept ( $\beta_{0d}$ )	.94**	0.24	
Self-reported assertiveness ( $ASI_{actor}$ )	0.27**	0.10	0.70
Partner's self-reported assertiveness ( $ASI_{partner}$ )	.19+	0.10	0.49
$(ASI_{sum})^2$	-0.03*	0.01	0.66

Note. All predictors except  $ASI_{sum}$  are grand-mean centered.  
 +  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Figure 7  
*Post-hoc scatterplot illustrating the curvilinear relationship between  $ASI_{sum}$  and actor's condom use.*



assertiveness also showed low condom use. In between these two extremes, couples with condom use is most common among couples who exhibit an “ideal” level of assertiveness, as will be discussed below.

In addition to the significant curvilinear term, the actor's assertiveness was positively related to condom use, as was seen in previous models ( $t(28.16) = 2.830, p = .01, d = .70$ ). As seen in the previous model, the partner's self-reported assertiveness was marginally associated with higher condom use ( $t(28.45) = 2.00; p = .06, d = .49$ ). Possible explanations for these results will be discussed below.

## Hypothesis 2: Model Structure

Hypothesis two predicts that relational uncertainty (RU) is inversely correlated with assertiveness (AS1 and AS2) during condom negotiation. RU, the independent variable, was used to predict both AS1 and AS2. The following covariates were used: gender (G), relationship length (RL), depression (DEP), and desire to use a condom (DC). Desire to use a condom was included as a covariate to control for the possibility that some youth wanted to use condoms more so than others. Interaction terms were entered as well. Hypothesis 2 was tested using two models (see Figure 2). The first model used self-reported assertiveness (AS1) as the dependent variable. The second model used partner-reported assertiveness (AS2) as the dependent variable. The following equation shows the full model for Hypothesis 2, using AS1 as the DV.

$$(4) \quad \text{Level 1:} \quad AS1_{di} = \beta_{0d} + \beta_1(RU_i) + \beta_2(RL_i) + \beta_3(DEP_i) + \beta_4(DC_i) + \beta_5(G_i) + \beta_6(RU_i * G_i) \\ + \beta_7(RL_i * G_i) + \beta_8(DEP_i * G_i) + \beta_9(DC_i * G_i) + r_{i0}$$

$$\text{Level 2:} \quad \beta_{0d} = \gamma_{00} + u_{0d}$$

$$\beta_1 = \gamma_{10} \quad \beta_6 = \gamma_0$$

$$\beta_2 = \gamma_{20} \quad \beta_7 = \gamma_{70}$$

$$\beta_3 = \gamma_{30} \quad \beta_8 = \gamma_0$$

$$\beta_4 = \gamma_{40} \quad \beta_9 = \gamma_0$$

$$\beta_5 = \gamma_{50}$$

Explanations for each term in the model are as follows:

$AS1_{di}$  = the predicted value of AS1 for individual  $i$  in dyad  $d$ .

$\gamma_{00}$  = the intercept, which is the grand mean of AS1 in the sample when all other predictors are held equal to zero. If no other predictors were used, this would be the individual's predicted score. Because females are coded "0", this intercept is equal to the female mean of AS1.

$u_{0d}$  = the degree to which the intercept for dyad  $d$  differs from the predicted intercept ( $\gamma_{0d}$ ) when all predictors are held equal to zero. That is, the degree to which the average level of AS1 in dyad  $d$  differs from the grand mean.

$\beta_{0d}$  = the average level of AS1 in dyad  $d$  when all level-1 predictors are held equal to zero. It is a combination of the grand mean that dyad  $d$ 's departure from that mean.

$\beta_1$  and  $\gamma_{10}$  = maximum likelihood estimate of the average difference in AS1 for a 1-unit increase in individual  $i$ 's RU. This parameter represents a primary research question. A significant main effect indicates that an individual's relational uncertainty significantly predicts their level of assertiveness when all other variables are held constant.

$\beta_2$  and  $\gamma_{20}$  = maximum likelihood estimate of the average difference in AS1 for a 1-unit increase in individual  $i$ 's RL. This parameter is a covariate and is meant to remove variance in AS that is associated with RL. A significant main effect indicates that an individual's length of relationship significantly predicts their level of assertiveness when all other variables are held constant.

$\beta_3$  and  $\gamma_{30}$  = maximum likelihood estimate of the average difference in AS1 for a 1-unit increase in individual  $i$ 's DEP. This parameter is a covariate and is meant to remove variance in AS1 that is associated with DEP. A significant main effect indicates that an individual's depression predicts their level of assertiveness when all other variables are held constant.

$\beta_4$  and  $\gamma_{40}$  = the mean difference in AS1 between those who wanted to use condoms and those who did not. A significant main effect indicates that these groups differ with respect to their level of AS1, when all other predictors are held constant.

$\beta_5$  and  $\gamma_{50}$  = the difference between male and female AS1 means, controlling for all other predictors. Female was coded 0 and male was coded 1. A significant main effect indicates that males and females differed with respect to their level of AS1, when all other predictors were held constant.

$\beta_6$  and  $\gamma_{60}$  = maximum likelihood estimate of the differential impact of RU1 on AS1, depending on whether the actor is male or female. This parameter acts as a covariate, and removes variance due to the differential impact of RU1 on AS1 if that relationship differs by gender.

$\beta_7$  and  $\gamma_{70}$  = maximum likelihood estimate of the differential impact of RL on AS1, depending on whether the actor is male or female. This parameter acts as a covariate, and removes variance due to the differential impact of RL on AS1 if that relationship differs by gender.

$\beta_8$  and  $\gamma_{80}$  = maximum likelihood estimate of the differential impact of DEP on AS1, depending on whether the actor is male or female. This parameter acts as a covariate, and removes variance due to the differential impact of DEP on AS1 if that relationship differs by gender.

$\beta_9$  and  $\gamma_{90}$  = maximum likelihood estimate of the differential impact of DC on AS1, depending on whether the actor is male or female. This parameter acts as a covariate, and removes variance due to the differential impact of DC on AS1 if that relationship differs by gender.

$r_i$  = the degree to which an individual's score differs from their predicted score (i.e., variance that is unexplained by the full model).

This basic model was run twice. The first time, all of the predictors were used to predict AS1; the second time, identical predictors were used to predict AS2. The procedure for testing the current model was nearly identical to that used in Hypothesis 1.

### *Preliminary Analyses for Hypothesis 2*

As shown above, variables were examined for normality and were transformed to approximate normal distributions. Although many assumptions were checked in the previous model, Hypothesis 2 contained different outcome variables and an additional predictor. Preliminary analyses were therefore performed for Hypothesis 2, as well.

*Test of nonindependence.* Analyses for the previous hypothesis showed that many of the variables in the study were nonindependent. In Hypothesis 2, Relational Uncertainty (RU) was added to the model. Couple members' RU scores were not correlated and were therefore independent ( $r = -.03, p = .81$ ). Because other variables in the model were nonindependent, dyadic analysis was still considered necessary.

*Assessing distinguishability of dyad members.* Distinguishability of dyad members were tested using the methods described in Appendix F. T-tests indicated that males and females did not differ in their mean level of AS1 or AS2. Males and females showed similar variance structures on both outcome variables (AS1 and AS2). Similarly, the sums and differences of each outcome score in male-female dyads were uncorrelated. Although these correlations were not significant, a gender term was included in the model for theoretical reasons. Numerous studies have focused on women's assertiveness and condom use, whereas few have examined males (Jack & Dill, 1992; Teitelman et al., 2011). Therefore gender term was therefore maintained in the initial model, and would be removed if it were not significant.

### *Model A: Building the final model*

As in Hypothesis 1, this model was run in a series of steps. First, a model was run containing only the random intercept as a predictor (Heck, et al, 2010). The intercept neared

a liberal test significance ( $Wald Z = 1.169, p = .12$ ), suggesting that couples were somewhat similar in their mean level of self-reported assertiveness. Because of the trend toward significance, the random intercept was retained in the model. All predictors, covariates, and interaction terms were then added as fixed effects. Length of relationship (RL) and desire to use a condom (DC) were not significant covariates, so they were removed from the model. The final model is shown in Table 6. The final SPSS syntax is shown in Appendix I.

*Checking model assumptions for Model A:*

After the final model was run, the assumptions were checked using strategies suggested by Singer and Willett (2003, see Appendix K). Level-1 residuals deviated mildly from a normal distribution. This may have been caused by a small sample size or truncated distributions in the sample. The assumption of homoscedasticity was met. Together, these results indicate that this model deviated mildly from its assumptions.

***Results of analysis for Model A:***

This model tested the hypothesis that individuals with higher relational uncertainty will show lower levels of assertiveness during the condom negotiation task. This was a primary research question. An initial intercept-only model suggested that each couples' level of AS1 is significantly different, and therefore a random intercept was deemed appropriate ( $Wald Z = 1.649, p = .05$ ). Fixed effects were then added. Relationship length and desire to use condom were not significant and were removed from the model. In the final model, only depression, relational uncertainty, gender, and their interactions remained (see Table 6).

Regarding the primary research question, the main effect for RU was not significant. Instead, the RU\*Gender interaction approached significance ( $t(55.43) = 1.680; p = .10$ ), with a small-to-moderate effect size of .42. Scatterplots (Figure 8) illustrate gender differences.

Table 6  
Multilevel model predicting ASI (Hypothesis 2, Model A)

Predictor	Unstandardized HLM Coefficient	Standard Error	Effect Size
Intercept ( $\beta_{0d}$ )	1.91**	0.22	
Relational Uncertainty (RU; $\beta_1$ )	-0.95	0.71	
Depression (DEP; $\beta_3$ )	1.26**	0.43	0.72
Gender (G; $\beta_5$ )	-0.11	0.27	
RU*Gender ( $\beta_6$ )	1.70+	1.01	0.42
DEP*Gender ( $\beta_8$ )	-1.73*	0.68	0.64

Note. Gender is coded 1 for women and 0 for men. All other predictors except Gender are grand-mean centered.

+  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Figure 8

Scatterplots illustrating the correlation between RU and ASI for men and women (Hypothesis 2, Model A)

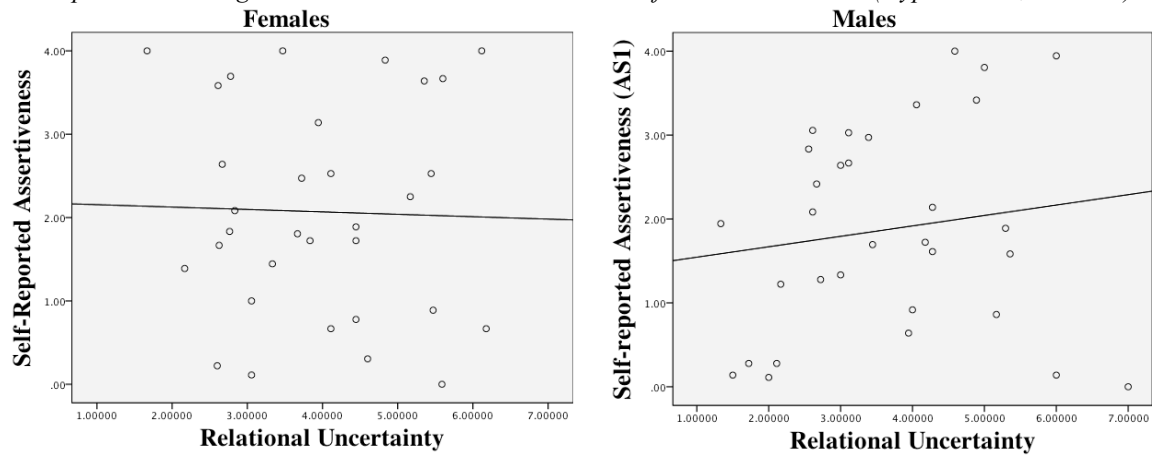
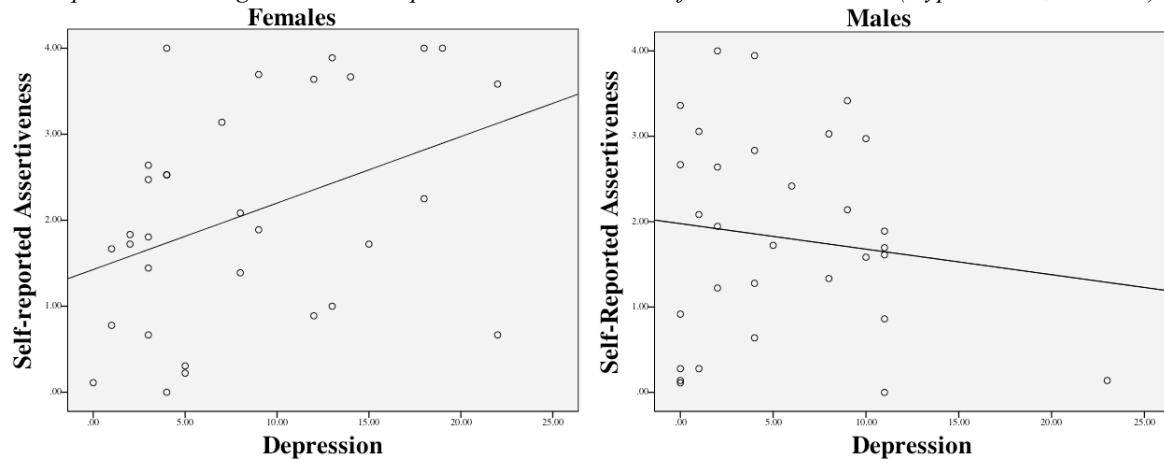


Figure 9

Scatterplots illustrating the relationship between DEP and ASI for men and women (Hypothesis 2, Model A)





Among women, there was a very small and nonsignificant downward trend that fell in the hypothesized direction. This association was unexpectedly small, given the large number of studies suggesting that women with high relational uncertainty tend to self-silence in order to maintain their relationship (e.g., Smith et al., 2010; Tschann et al., 2010). Among men, a marginally significant association emerged in the opposite direction; men with higher levels of relational uncertainty reported higher levels of assertiveness during condom negotiation. However, this effect was fairly small, with a zero-order correlation of .25. Overall, relational uncertainty contained little predictive power in explaining youths' self-reported assertiveness, and provided little support for the predictions of Uncertainty Management Theory. These results were further explored using post-hoc analyses (below).

In the initial model, the depression covariate yielded significant effects. A significant interaction between depression and gender ( $t(49.891) = -2.591, p = .01$ ) had a medium effect size ( $d = .64$ ). Although this interaction was significant, results were not in the expected direction (See Figure 9). For women, depression was positively correlated with assertiveness ( $r = .39$ ). This was surprising, given that several studies have found that depression can interfere with assertiveness (Gratch et al., 1995; Knobloch & Knobloch-Fedders, 2010). For women, depression had a stronger impact upon assertiveness than did relational uncertainty. Given the moderate correlation between depression and assertiveness ( $r = .45$  in women), it is possible that women's depression overshadowed the effects of relational uncertainty, leading them to become more assertive during the conversation. For males, depression and relational uncertainty produced an opposite pattern of results. The scatterplot of male scores show a single outlier, which was not removed because the score was similar to those of females (Figures 9). Among men, depression and relational uncertainty were moderately

correlated ( $r = .64$ ). While relational uncertainty was associated with higher assertiveness in men, depression appeared to exert a dampening effect on assertiveness. Together, these results suggest that the combination of relational uncertainty and depression may be more important than either of these variables in isolation. However, hypotheses were not supported.

*Post-hoc analyses for Hypothesis 2, Model A:*

Post-hoc analyses were used to disentangle the complex pattern of correlations between gender, depression, and relational uncertainty. A two-way interaction term between relational uncertainty and depression (RU\*DEP) was added to the model to determine whether these variables showed greater effects in combination than in isolation. Because of the gender differences observed above, a three-way interaction was also added to the model (RU\*DEP\*GENDER). Not only was this three-way term highly significant ( $t(54.53) = -3.29; p = .00$ ), the augmented model explained significantly more variability than the original model ( $X^2(1) = 4.669; p < .05$ ). Additionally, the three-way interaction had a large effect size ( $d = .82$ ). The two-way interaction was removed due to lack of significance; the final

Table 7

*Post-hoc multilevel model predicting ASI. Includes three-way interaction between depression, relational uncertainty, and gender.*

Predictor	Unstandardized HLM Coefficient	Standard Error	Effect Size
Intercept	2.15**	0.80	
Relational Uncertainty	-0.18	0.17	
Depression	0.09*	0.03	0.67
Gender	-3.44**	1.27	0.68
RU*GENDER	0.92**	0.28	0.81
DEP*GENDER	.34*	0.16	0.52
DEP*RU*GENDER (three-way interaction)	-0.09**	0.03	0.82

Note: Gender is coded 1 for women and 0 for men. Predictors are not grand-mean centered.

<sup>†</sup> $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

model deviated somewhat from its assumptions. Table 7 shows the results of this analysis. The interaction of depression and relational uncertainty was uniquely important in predicting assertiveness, but this association differed by gender. The interaction of depression and relational uncertainty is a simple multiplication of two nonzero numbers; higher values are associated with greater depression *and* relational uncertainty. A partial correlation revealed that this interaction predicted assertiveness in men ( $r_{\text{partial}} = -.59; p = .00$ ), but had no impact on women's assertiveness. Men who reported high relational uncertainty and high depression therefore particularly low assertiveness scores. Conversely, low depression and relational uncertainty in men yielded high assertiveness scores. For women, the interaction between depression and relational uncertainty was not correlated with assertiveness. Instead, depression appeared to have the strongest impact upon women's assertiveness, as was shown in the previous model. The results of post-hoc analyses lent support for the hypotheses in men, but not in women. Although relational uncertainty alone increased assertiveness for men, the combination of depression and relational uncertainty dampened their assertiveness.

### ***Results of analyses for Model B***

This model was similar to the model presented above, but used AS2 as the outcome variable rather than AS1 (See Appendix I for syntax). As discussed in Hypothesis 1, AS2 actually measures the partner's self-reported assertiveness rather than the actor's assertiveness. As such, this model could not be interpreted as originally hypothesized. None of the predictors reached significance and are therefore not presented here. This null finding indicates that each participant's relational uncertainty was unrelated to their partner's assertiveness. Youths' relational uncertainty, depression, and desire to use a condom were also unrelated to their partner's level of assertiveness.

### Hypothesis 3: Model Structure

Hypothesis 3 predicts that assertiveness during condom negotiation mediates the relationship between relational uncertainty and condom use (see Figure 3). That is, youth who have high levels of relational uncertainty are hypothesized to exhibit low assertiveness during condom negotiation, which in turn leads to low condom use. Conversely, youth with low relational uncertainty are hypothesized to exhibit high assertiveness during condom negotiation, which in turn high condom use. A series of multilevel models were used to test this hypothesis, as will be described below. Although path models are often used to test for mediation, path models are not recommended in dyadic analysis due to their high complexity (Kenny, et al., 2006). A stepwise hierarchical linear model was instead used to test for mediation. The first model was run without the proposed mediating variables. Mediating terms were then added to determine whether they accounted for additional variance.

The first step of this hypothesis test aimed to establish the link between relational uncertainty and condom use (Figure 3, path 1). The second step aimed to establish whether this relationship was accounted for by assertiveness (Figure 3, Paths 2 and 3). Path 1 was tested first. Below is the multilevel model that was used to test this path.

$$(5) \quad \text{Level 1:} \quad CU_{di} = \beta_{0d} + \beta_1(RU_i) + \beta_2(RL_i) + \beta_3(DEP_i) + \beta_4(DC_i) + \beta_5(G_i) + \beta_6(RU_i * G_i) \\ + \beta_7(RL_i * G_i) + \beta_8(DEP_i * G_i) + \beta_9(DC_i * G_i) + r_{i0}$$

$$\text{Level 2:} \quad \beta_{0d} = \gamma_{00} + u_{0d}$$

$$\beta_1 = \gamma_{10} \quad \beta_6 = \gamma_0$$

$$\beta_2 = \gamma_{20} \quad \beta_7 = \gamma_{70}$$

$$\beta_3 = \gamma_{30} \quad \beta_8 = \gamma_0$$

$$\beta_4 = \gamma_{40} \quad \beta_9 = \gamma_0$$

$$\beta_5 = \gamma_{50}$$

Because the interpretation of terms in this model is similar to those in Hypotheses 1 and 2, they will not be discussed here.

The second step used to test Hypothesis 3 was adding the two assertiveness terms to the model. This model is presented below, with mediating terms bolded:

$$(6) \quad \text{Level 1:} \quad CU_{di} = \beta_{0d} + \mathbf{\beta_2(AS1_i)} + \mathbf{\beta_3(AS2_i)} + \beta_4(RU_i) + \beta_5(RL_i) + \beta_6(DEP_i) + \beta_7(DC_i) + \beta_8(G_i) + \beta_9(RU_i * G_i) + \beta_{10}(RL_i * G_i) + \beta_{11}(DEP_i * G_i) + \beta_{12}(DC_i * G_i) + r_{i0}$$

$$\text{Level 2:} \quad \beta_{0d} = \gamma_{00} + u_{0d}$$

$$\beta_1 = \gamma_{10} \quad \beta_7 = \gamma_{70}$$

$$\beta_2 = \gamma_{20} \quad \beta_8 = \gamma_{90}$$

$$\beta_3 = \gamma_{30} \quad \beta_9 = \gamma_{10}$$

$$\beta_4 = \gamma_{40} \quad \beta_{10} = \gamma_{10}$$

$$\beta_5 = \gamma_{50} \quad \beta_{11} = \gamma_{11}$$

$$\beta_6 = \gamma_{60} \quad \beta_{12} = \gamma_{12}$$

The two models (equations (5) and (6)) were compared. The null hypothesis is that the addition of assertiveness (equation 6) does not reduce the variability accounted for by relational uncertainty. This hypothesis would be supported by the following findings: (a) in the first model, relational uncertainty would be a significant predictor of condom use, and (b) in the second model, the addition of assertiveness to the model would diminish the amount of variance accounted for by relational uncertainty. If the addition of the assertiveness terms does to reduce the amount of variance accounted for by relational uncertainty, the null hypothesis would be supported.

### *Preliminary Analyses for Hypothesis 3*

All predictors, covariates, and outcome measures in this model were used in Hypotheses 1 and 2. The preliminary analyses for Hypothesis 3 are therefore redundant and are not presented here.

### *Building the final model*

After the preliminary analyses had been completed, the actual model was run in a series of steps. Because the same outcome variable was used in Hypothesis 1, it was evident that the random intercept would be significant ( $Wald Z = 2.224, p = .01$ ), meaning that couples significantly differed in their mean levels of condom use. The random intercept was therefore retained in the model. All of the predictor variables and covariates (except gender and DC) were centered around the grand mean such that zero became a meaningful value. The initial model (equation 5) was run with all predictors and covariates (see Appendix J for syntax). None of the terms in this model were significant, predictors of condom use. The mediation portion of the model was therefore not run (equation 6).

### ***Results of analyses for Hypothesis 3***

Contrary to expectation, relational uncertainty was not related to condom use. This was surprising, given other studies have linked the same or very similar measures youths' condom use (Feeney et al., 2000; Strachman & Impett, 2009). This null finding was confirmed using other statistical tests. A zero-order correlation showed no association between relational uncertainty and condom use ( $r = .05, p = .71$ ). To control for the possibility that skew in the CU distribution interfered with statistical inference, condom use was dichotomized into two categories (“never” versus “sometimes/always”). A t-test revealed that these two groups did not differ in their level of relational uncertainty ( $t(62) = .49; p = .63$ ). Multiple methods of comparison therefore confirmed that condom use and relational uncertainty were unrelated in the current sample.

## CHAPTER 4

### **Discussion**

The present study explored young couples' condom negotiation using Uncertainty Management Theory as a theoretical framework. Established high-risk young couples were videotaped during a condom negotiation task. It was hypothesized that (1) assertiveness during condom negotiation would be positively correlated with their self-reported condom use, (2) relational uncertainty would be inversely correlated with assertiveness, and (3) assertiveness would mediate the association between relational uncertainty and condom use. Limited support was found for these hypotheses, suggesting that Uncertainty Management Theory may not be an appropriate framework for conceptualizing youth condom negotiation. Although the overall model was not supported, the present study provided several important insights regarding condom negotiation in high-risk couples.

#### ***Hypothesis 1: Assertiveness and condom use***

Hypothesis 1 stated assertiveness would be positively correlated with condom use. Overall, analyses showed limited support for this hypothesis. Assertiveness was measured with two variables—AS1 (actor's self-reported assertiveness) and AS2 (partner's report of actor's assertiveness). The initial model showed a small positive correlation between self-reported assertiveness (AS1) and condom use. If AS1 had been entered without AS2, Hypothesis 1 would have been supported because a positive linear correlation would have been found between assertiveness and condom use. However, the inclusion of AS2 dampened the effect of AS1, revealing that the inclusion of both partners' ratings allowed for a more nuanced understanding of assertiveness and condom use. Post-hoc analyses facilitated interpretation, as will be

discussed below.

*Assertiveness: What was being measured?*

The operationalization of assertiveness in the current study is different from previous studies and represents a unique contribution of the present research. A number of previous studies have documented a positive linear association between self-reported assertiveness and condom use, but the present study revealed more nuanced findings. This was likely impacted by differences in the way that assertiveness was measured. Many studies measure assertiveness using a global self-report measure, asking participants to rate their assertiveness “in general” (e.g., Diclemente et al., 2001; Guzman et al., 2003; Manlove et al., 2007a). In the present study, assertiveness was measured within the context of an actual conversation. Each participant’s total assertiveness score represents an average of their assertiveness self-ratings across 14 time points. As such, high scores on the present assertiveness measure represent high levels of assertiveness that were sustained over an entire 5-minute conversation.

The assertiveness construct in the current study also adds nuance to previous research it did not measure explicit condom talk. Instead, AS1 and AS2 captured youths’ perceptions and emotions as they discussed issues related to their condom use. Conversational content can be studied on multiple levels. Whereas “manifest content” refers to the spoken words in a conversation, “latent content” refers to the emotional meaning behind the spoken words (Kondracki, Wellman, & Amundson, 2002). The current study measured the “latent content” of youths’ conversations by measuring the self-reported emotional tone behind the actual words. While manifest content of the current conversations included the couples’ own condom use, plans for the future, friends’ condom use, and similar topics, AS1 and AS2 measured the latent meaning with which participants imbued their spoken words. The unique operationalization of



the assertiveness variables should be considered when interpreting results.

*Self-reported assertiveness and condom use*

In the absence of other variables, AS1 (self-reported assertiveness) predicted condom use in the hypothesized direction. Although this was complicated by post-hoc findings, the positive linear correlation between AS1 and condom use was a replication of previous findings (Guzman et al., 2003; Manlove et al., 2007a; Tschann et al., 2010). Few studies have explored the mechanism through which assertiveness impacts condom use. One possibility is that individuals who want to use condoms assertively state their desire, whereas individuals who do not want to use condoms have no reason to be assertive. Evidence suggests, however, that many youth are ambivalent about condom use. High-risk youth are generally aware of high seroprevalence and concurrent partnering in their sexual networks (Bauman & Berman, 2005; Carey, Senn, Seward, & Venable, 2008; Singer et al., 2006), and many express the desire to use condoms to protect their health and future (Crosby et al., 2003; Noar et al., 2006; Bauman & Berman, 2005). However, those who would like to use condoms do not always state this desire to their partner (Bauman & Berman, 2005; Leonard et al., 2011; Teitelman et al., 2011; Tschann, et al., 2010). As measured by youths' desire to use a condom, ambivalence was high in the current sample; only 14 participants reported no desire to use a condom with the current partner. A similar explanation for present results is that some young couples in the current sample agreed that they did not want to use condoms, and therefore experienced a harmonious conversation and low condom use. However, this was not a major factor in the current study, as only one couple consisted of both partners who did not want to use condoms. For all other couples, at least one partner exhibited some degree of ambivalence. Individuals' willingness to voice their ambivalence to the partner was an important predictor of their condom use, even after controlling

for couple-level interactions. Future studies should continue to explore relationship dynamics that facilitate individuals' assertiveness.

#### *Couple-level assertiveness and condom use*

Findings related to AS1 were complicated by the inclusion of AS2, which was negatively correlated with condom use. Post-hoc analyses revealed that couples' combined level of self-reported assertiveness showed a curvilinear relationship with condom use. This is inconsistent with previous studies, which showed a positive linear relationship between assertiveness and condom use (e.g., Widman et al., 2006). While low condom use among two unassertive partners is expected, existing literature would predict that two highly assertive couple members would use condoms often. Instead, couples with two highly assertive members showed very low condom use; those with moderate levels of assertiveness were most likely to use condoms (see Figure 7). This finding may be related to the developmental context of youths' romantic relationships.

As previously noted, young people's relationships ideally create a safe, accepting environment in which youth express their views without fear of relational dissolution (McIsaac et al., 2008). Such interactions are usually characterized by fluctuation between conflict and harmony rather than sustained, insistent self-advocacy (Gottman et al., 1998; Losada & Heaphy, 2004; Kugler & Coleman, 2009). In the present study, moderate assertiveness scores represent a balance between short bursts of conflict and positive interactions that maintained intimacy; these interactions may have allowed for the comfortable expression of intimacy and the possibility of condom use. Conversely, couples with two highly assertive partners may experience sustained conflict over time, potentially resulting in a deadlocked interaction that leaves partners feeling that both their autonomy and their relationship are threatened (Knee et al., 2008; Noom et al., 2001; Welsh & Shulman, 2008; see appendix L for sample transcripts from low-, moderate- and

high-conflict couples). These feelings may be related to their condom use patterns.

Highly assertive couples may balance intense arguments with equally intense physical intimacy. High conflict in youth relationships has been linked to more frequent sexual intercourse and fewer non-genital affectionate behaviors (e.g., kissing; Rotosky, Galliher, Welsh, & Kawaguchi, 2000; Welsh & Dickson, 2005). Similarly, low condom use has been documented among couple with high levels of conflict and emotional intensity (Manning et al., 2009; Teitelman, Dichter, Cederbaum, & Campbell, 2007). After highly conflictual encounters, youth who are ambivalent about condom use may find that their own desires are overshadowed by the need to re-establish intimacy with their partner. Given its symbolic importance, unprotected sex may be used to re-affirm the relationship in the absence of other conflict resolution strategies.

*Correlation between self- and partner- ratings of assertiveness*

Although not directly related to the hypotheses, the pattern of correlations between self and partner ratings was also noteworthy. AS2 (the partners' rating of an actors' assertiveness) was originally conceptualized as an additional measure of the actor's assertiveness. Consistent with other studies, however, youths' ratings of their partner's behavior diverged from the partners' ratings of themselves (Welsh & Dickson, 2005; Welsh et al., 1999; Darling & Clarke, 2009). Divergent ratings are not surprising; major psychological theories suggest that individuals interprets others' behaviors based on their own "schemata" (i.e., their internal expectations, anxieties, and biases). Such tenets are found in Psychoanalytic Theory, Cognitive Behavioral Theory, Attachment Theory, and the Theory of Motivated Cognition (Beck, 1979; Bowlby, 1977; Freud, 1937; Murray & Holmes, 1999). Studies of rating divergence suggest that rating accuracy may be impacted by developmental and emotional issues. Adults tend to rate their

partners more accurately than do youth, and youths' ratings of their partners may be particularly divergent during relationally-threatening conditions (Ickes, 1993; Simpson, Ickes, & Blackstone, 1995; Simpson, Orina, & Hicks; 2003).

Although youths' ratings of their partners usually diverged from the partner's actual ratings, each participant rated their own and their partner's assertiveness in almost exactly the same way ( $r = .97$ ). Darling and Clarke (2009) used the term "emotional mirroring" to describe a similar phenomenon. This term is used here to describe the high correlations between each participant's self- and partner-ratings. Several video recall studies of young couples have documented emotional mirroring, but it is generally not the primary focus of research (Bentley, 2010; Smith et al., 2010). Previous studies suggest that emotional mirroring may be a developmentally normative aspect of youth romantic relationships. Emotional mirroring may be less common in youths' interactions with their parents (Welsh, Galliher, & Powers, 1998) and the interactions of married adults (Ickes, 1993). Bentley (2010) suggested that high emotional mirroring in youth romantic couples may be attributed to youths' developmental stage; many youth are still developing empathy and may be egocentric in their worldview (e.g., Elkind, 1967). It is also possible that emotional mirroring may be the result of the intense emotional connections that characterize youth relationships and subside in long-term marriages (Larson, Clore, & Wood, 1999). Given that many youth cite partner perceptions as a reason for not using condoms (Fortenberry, 2010), emotional mirroring may particularly relevant to intervention, as will be discussed below.

### ***Hypothesis 2: Relational Uncertainty and Assertiveness***

Guided by Uncertainty Management Theory, it was hypothesized that relational uncertainty would be inversely correlated with assertiveness during a condom negotiation task. This was tested

using two measures of assertiveness. In the first model, hypotheses were unsupported for women. For men, relational uncertainty was positively correlated with assertiveness, producing results opposite of the hypothesized direction. The unexpected correlations between gender, depression, and relational uncertainty led to exploratory post-hoc analyses. For both genders, depression impacted assertiveness during condom negotiation. Each construct is discussed below, followed by gender-specific findings.

### *Relational Uncertainty*

Relational uncertainty produced few significant findings in the current study. This construct was measured using the Attachment Anxiety subscale of the ECR, a widely-used instrument that measures an individual's worry about their partner's commitment level. Previous findings linking high relational uncertainty with low assertiveness in youth and young adults were not replicated in the current study (Cooper, Shaver, & Collins, 1998; Gebhardt et al., 2003; Strachman & Impett, 2009). These unexpected null results may have been influenced by several issues. First, Uncertainty Management Theory presumes that individuals are motivated to behave in ways that maintain their current relationship. Some of the participants may have had low emotional investment in the relationship, rendering relational uncertainty an irrelevant construct. For example, some participants reported that they had concurrent sexual partners, making it difficult to ascertain the emotional importance placed on the current relationship. Another reason for nonsignificant findings may be that relational uncertainty has low relevance to the relationships of urban minority youth. While the majority of research in relational uncertainty and related constructs has examined Caucasian samples, Volz and Kerig (2010) found that high-risk African-American and Latina women report lower relational uncertainty than high-risk white women, possibly due to higher levels of self-esteem (Brown et al., 1998; Molloy & Herzberger, 1998).

It is also that possible couples with high relational uncertainty avoided the study, leading to a self-selected sample, truncated range, and null findings. In order to take part in the study, participants were required to recruit their partner; simply asking a partner to participate in a “couples” study may be experienced as a relationally-salient interaction. Moreover, the condom negotiation task may have been daunting for youth who were uncertain about the commitment level in the relationship, and they may have avoided the study entirely. For these reasons, the current sample may not have represented the true range of relational uncertainty in the population. A final reason for null findings related to relational uncertainty is its considerable overlap with depression. This is discussed in the following section.

### *Depression*

Depression was included as a covariate because it has previously been associated with low condom use (DiClemente et al., 2001; Shrier et al., 2010), low assertiveness (Harper et al., 2006; Prinstein et al., 2005), and high relational uncertainty (Knobloch & Knobloch-Fedders, 2010; Murphy & Bates, 1997). Unexpectedly, depression produced more powerful findings than relational uncertainty and is therefore discussed here in detail. Depression is defined as a combination of negative mood, anhedonia, and low energy (American Psychiatric Association, 2000; see Appendix B). Depressed individuals often possess a negative self-schema (e.g., “I am worthless”) and may interpret external events in ways that confirm their negative self-concept (Beck, Rush, Shaw, & Emery, 1979; Shrier et al., 2001). These beliefs are thought to lead to negative mood, which in turn reinforces depressive cognitions in a self-sustaining cycle (Haaga, Dyck, & Ernst, 1991). It is therefore not surprising that youths’ perceptions during condom negotiation were strongly influenced by their level of depression.

### *Depression and relational uncertainty*

Consistent with previous studies, depression was positively associated with relational uncertainty in the current sample ( $r = .51$ ; Burnette, Davis, Green, Worthington, & Bradfield, 2007; Knobloch & Knobloch-Fedders, 2010; Wei, et al., 2005). Depressive cognitive schema may account for the co-variation between depression and relational uncertainty. Depressed individuals tend to view themselves in a negative light, and often seek validation from others (Wei et al., 2005). However, they often have difficulty believing that a good person loves them, leading them to apply a negative interpretive schema to partner behavior and raising relational uncertainty (Murphy & Bates, 1997; Murray et al., 2001). Conversely, non-depressed individuals appear to have a positive bias when interpreting partner behavior, which may buffer them against relational uncertainty. In the following section, findings from Hypothesis 2 regarding depression, relational uncertainty, and condom negotiation will be discussed. Findings pertaining to each gender will be discussed in turn.

### *Sociocultural context of gendered interactions*

Analyses of Hypothesis 2 revealed that assertiveness, depression, and relational uncertainty showed different patterns of correlations in males and females. Patterns of findings were often inconsistent with other literature (e.g., Harper, Dickson, & Welsh, 2006; Impett & Peplau, 2002; Kane et al., 2007; Simpson, 1990). When interpreting these findings among a sample of predominantly youth of color, it is important to keep in mind the socioeconomic and structural inequalities that impact cognitions, motivations, and behavior between males and females of color living in marginalized communities (Collins, 2000). For high-risk youth, normative youth romantic experiences such as falling in love, worrying about partner commitment, having unprotected sex, breaking up, and cheating on partners take place within the context of

considerable social and structural risk. They are more likely to experience stressful experiences such as abuse, violence, substance use, and untreated depression when compared to middle class youth (Fitzpatrick, Piko, Wright, & LaGory, 2005). Moreover, their normative sexual behaviors take place within social-sexual networks of high STI and HIV prevalence (Adimora & Schoenbach, 2005). When studying the behavior of high-risk youth in their romantic relationships, it is important to interpret findings in light of this social context.

*Assertiveness, depression, and relational uncertainty in males*

Existing literature suggests that youth males who experience high uncertainty about their relationship also show low assertiveness toward their romantic partner (Harper et al., 2006). However, the current study revealed that men with higher relational uncertainty reported *higher* assertiveness during the interaction. Although this finding was contrary to expectation, it may be understood in the context of gendered socialization norms. In American culture, assertiveness and competitive behavior tend to be valued in males (McHale, Crouter, & Tucker, 1999; Peters, 1994; Staples, 2006). Expectations and behavior during romantic courtship and interactions often follow gender-specific scripts. Men may be expected to pursue women, rather than the other way around; additionally, young males may encourage each other to gain more sexual experience with females (Kreager & Staff, 2009; Laner & Veteran, 2000). In the present study, these gendered scripts may influence male behavior. Males who experience uncertainty about their relationships may experience a condom negotiation task as a means of reducing uncertainty. This may have led them to assertively negotiate the commitment level of the relationship with their partner, rather than maintaining the level of uncertainty.

The introduction of the Depression covariate complicated these findings. While relational uncertainty alone predicted higher male assertiveness, a significant three-way interaction



revealed that men who experience high relational uncertainty *and* high depression reported low assertiveness during the conversation. While this finding supported Uncertainty Management Theory, it was surprising that depressed males were the only group displaying this pattern of behavior. Gendered patterns of socialization, as well as cognitive biases associated with depression, may have led to this effect. As stated above, men may be socialized to behave assertively toward others. Same-sex male friendships are often characterized by insistent and antagonistic interactions, whereas intimate self-disclosure and relational problem-solving are more likely to be seen among girls' same-sex friendships (Maccoby, 2000). Shulman and Scharf (2000) have hypothesized that gendered socialization patterns may lead to gendered patterns of behavior within youths' romantic relationships. Because some males may have limited experience with emotional relational problem-solving, youth boys tend to allow their girlfriends to take the lead during relationally-salient conversations and romantic conflict (Gratch, Bassett, & Attra, 1995; Harper & Welsh, 2007). Consistent with those findings, the present sample showed slightly higher assertiveness in females than in males, although this was not a statistically significant difference.

Although some studies have found that men are normatively less assertive than women in during romantic conflict, low levels of assertiveness may have been magnified by depression. Studies of African-Americans, Caucasians, and Latinos have previously linked men's depression to low levels of assertiveness (Gratch et al., 1995; Harper, Dickson, & Welsh, 2006; Powers, Battle, Dorta, & Welsh, 2010). Depressed men in the present study may have experienced low self-concept, leading them to interpret partner behavior in a negative manner. Young men who experienced both relational uncertainty and depression may have felt that condom negotiation threatened the relationship, and consequently attempted to maintain harmony in the interaction.

Conversely, non-depressed men who were secure in their relationship showed willingness exhibit assertiveness during the interaction.

Of note, a number of other studies have found that depressed men are more likely to engage in hostile, abusive interactions with their relationship partners (Lipsky, Caetano, Field, & Bazargan, 2005; Rhodes et al., 2009). This stands in contrast to the present findings, in which male depression was related to harmonious interactions. These discrepant findings may have been a product of the self-selected nature of the current sample. While relationships involving power differentials, abuse, and controlling behavior undoubtedly exist in high-risk environments (e.g., Bowleg et al., 2000), youth in emotionally negative relationships may have been reluctant to participate in a study that involved intimate self-disclosure while being videotaped. In fact, trained observers who viewed the videotapes for the current study generally perceived the couples as harmonious and humorous. Additionally, the level of depression shown by men was relatively low (see Figure 9). If higher numbers of depressed or emotionally abusive males had participated in the study, different results may have been obtained.

#### *Assertiveness, depression, and relational uncertainty in females*

Assertiveness, depression, and relational uncertainty produced different patterns of results among women. Relational uncertainty was not related to women's assertiveness in any analyses. This was unexpected, given that relational uncertainty has been previously linked with low assertiveness and is considered an important construct in predicting women's emotions and behavior in romantic relationships (Harper, Dickson, & Welsh, 2006; Impett & Peplau, 2002; Kane et al., 2007; Simpson, 1990). However, the majority of research on relational uncertainty has focused on middle-class Caucasian women. Relational uncertainty may be less powerful in predicting the behavior of high-risk females, who may report fewer doubts about partner commitment than do

Caucasian women (Volz & Kerig, 2010). Rather than relational uncertainty, the present study found that depression was an important predictor of high-risk women's assertiveness. Depression was included as a covariate because previous studies have documented an inverse relationship between assertiveness and depression (Gratch et al., 1995; Harper & Welsh, 2007). Among women in the current sample, however, depression showed a positive relationship with assertiveness. This finding may be related to gendered socialization processes, racial/ethnic differences, and socioeconomic factors.

Depression may have increased women's perceptions of conflict, leading to higher assertiveness scores. As stated above, gender-specific socialization processes tend to emphasize competitive or antagonistic behavior among males, whereas maintenance of interpersonal relationships may be considered the domain of females (Gilligan, 1982; Rose & Rudolph, 2006). Same-sex female friendships tend to show higher levels of self-disclosure and intimacy than males same-sex friendships (Johnson, 2004; Shulman et al., 1997). Young women may bring these patterns of interactions to romantic relationships; when compared to men, they may show higher attention to partner emotions and feel greater responsibility for resolving relational conflicts (Hermann, et al., 2010; Shulman & Scharf, 2000; Welsh & Shulman, 2008). Women who are depressed, however, may have an exacerbated perception of conflict in the relationship. As stated above, depression has been associated with negative interpretations of partner behavior. Studies involving multiple ethnicities suggest that depressed women may be more likely than non-depressed women to perceive conflict in family and dating relationships (Constantine, 2006; La Greca, & Harrison, 2005; Ohr, Vidair, Gunlicks, Stoessel, Grove, & LaLima, 2010). Because the assertiveness construct measured, in part, the perception of conflict, higher scores in depressed women may represent those perceptions. Conversely, non-depressed women may have perceived

lower levels of conflict.

In addition to *perceptions* of conflict, the positive correlation between depression and assertiveness may have been related to higher levels of assertive *behavior* in women. Depressed women may not only interpret partners' behavior as negative, but they may also place great importance on resolving the perceived conflict and gaining reassurance about their partner's feelings for them (Prinstein et al., 2005; Wei, et al., 2005). Depressed women who sought validation from their partner may have used assertive techniques to gain reassurance about their partner's feelings toward them (Campbell et al., 2005; Cooper et al., 2006; Prinstein et al., 2005; Shaver & Mikulciner, 2002). In the absence of depression, women in the current study tended to view the conversation harmoniously and reported lower levels of assertive behavior.

The positive correlations between women's assertiveness and depression may also be influenced by the racial/ethnic background and socioeconomic status of the participants. The majority of research that associates high depression with low assertiveness has focused on Caucasian middle-class samples (Harper & Welsh, 2007; Impett & Peplau, 2006; Zaitsoff et al., 2002). The majority culture may value women's self-restraint and deference to males (Pipher, 1994; Piran & Cormier, 2005). Marginalized populations, however, may prepare their daughters to face potential discrimination by fostering assertiveness and truthfulness (Buckley & Carter, 2005; Ward, 1996). Women's assertiveness during romantic conflict may also be impacted by relationship expectations among high-risk samples. While middle-class samples may expect to participate in traditional marriage, structural limitations in impoverished communities may lead to flexible relationship configurations that are more adaptive in low-SES environments (e.g., cohabitation, multigenerational parenting; Adimora et al., 2007; Crissey, 2005; Edin & Reed, 2005; Lane et al., 2004). Rather than attempting to maintain the relationship at all costs, high-risk young women may see their own

relational needs and future plans as equally important to those of their male partners. Whereas middle-class women may benefit from self-silencing their desires during romantic conflict, assertiveness may protect high-risk young women against emotional abuse, unwanted unprotected sex, or other negative relationship outcomes associated with impoverished communities (Crosby et al., 2008; Teitelman et al., 2003).

The preceding paragraph presents assertiveness as a positive adaptive characteristic among high-risk young women. At the same time, assertiveness was related to higher depression among women. It is possible that this relationship can be explained by the cognitive biases associated with depression. As stated above, depression tends to be associated with negative cognitions such as low self-worth, perceptions of negativity in others, and high perceptions of conflict during interpersonal interactions (Constantine, 2006; La Greca, & Harrison, 2005; Wei, et al., 2005). Among high-risk females, heightened depression may have exacerbated their sense of conflict and negativity during the interaction. They may have experienced conflict as a cue to act assertively, engaging in a negotiation with their partner rather than using low assertiveness to maintain the relationship. Conversely, those with lower levels of depression may have perceived lower levels of negativity in the interaction, and may have felt less need to engage in assertive negotiation.

### ***Hypothesis 3: Relational uncertainty, assertiveness, and condom use***

The final hypothesis tested the full model predicted by Uncertainty Management Theory. It was hypothesized that relational uncertainty would be inversely correlated with condom use; assertiveness was expected to mediate this association. This hypothesis was unsupported; no terms in the initial model were significant. Particularly unexpected was the lack of correlation between relational uncertainty, given that other studies have documented this connection (Feeney, et al., 2000; Feeney et al., 1999; Strachman & Impett, 2009). Because null findings regarding relational

uncertainty were discussed above, they are not discussed in this section.

A lack of expected findings suggests that Uncertainty Management Theory may not be sufficient in explaining high-risk couples' condom use. Other theorists have also shown limited success using simple theories to explain condom use (e.g., Theory of Reasoned Action, Health Beliefs Model; Abraham & Sheeran, 1994). While the current study was unique in including relational and interpersonal constructs, findings from all three hypotheses were generally contrary to expectation. It is clear that a comprehensive theory of high-risk couples' condom use must take into account cultural factors, gender differences, interpersonal perceptions, psychosocial factors, and dynamic interactions between partners.

***Other findings:***

*Relationship length*

Relationship length was included as a covariate due to the common conception that condom use decreases over the course of romantic relationships (Fortenberry et al., 2002; Greene & Faulker, 2005; Ku et al., 1994; Manning et al., 2009; Tschann et al., 2010). In the present study, however, relationship length was entirely uncorrelated with condom use, and was therefore removed from all analyses. Although this may have been related to the skewed distribution of condom use, the current sample showed adequate variability in relationship length, with relationships ranging from 1 month to 6 years. This unexpected finding suggests that couples' condom use does not inevitably decline over the course of a relationship. Instead, couple-level variables and individual characteristics may allow some couples to maintain consistent condom use over months and years.

### ***Final thoughts: Relationship messages and uncertainty management***

Conceptualizing condom negotiation using Uncertainty Management Theory was based on the idea that condom negotiation was a relationally-salient conversation. A fundamental assumption of this study was that talking about condoms sends “relationship message” to partners; in other words, assertiveness was used as a proxy for youths’ willingness to send relationship messages. The current study did not examine the validity of this assumption, which may be an area for future research. Assuming, however, that assertiveness constitutes a relationship message, the current study examined how these messages were used to “manage uncertainty.” Results provided insights about which couples were willing to deliver relationship messages, how these messages served to maintain the relationship, and how they impacted condom use. Depression proved an important part of this process. Results of all three hypotheses are integrated below.

The highest levels of condom use were seen among couples that were moderately assertive during the conversation. These couples often consisted of a male who may be somewhat depressed and somewhat relationally uncertain; the female was also likely to be somewhat depressed. Both members generally saw moderate levels of assertiveness in one another, and often reported moderate or high desire to use condoms. These dynamics were “necessary but not sufficient” for consistent condom use—Figure 7 illustrates that many youth fitting these descriptions used condoms occasionally, or not at all. For those who used condoms, however, moderate levels of depression may have allowed for somewhat realistic viewpoints about the future and their relationship, leading couples to enjoy the relationship without being overly optimistic about their future together. Rather than being threatening, condoms may have been seen as a realistic, necessary part of the relationship.

Although many moderately assertive couples did not use condoms, more dramatic effects were seen at the extremes of assertiveness. As discussed above, couples with two highly assertive members showed low condom use. The female couple member was likely to be very depressed and the male was likely to have low depression and high relational uncertainty. As men may be less aware of emotional distress in their partners than females, they may have viewed condom negotiation as a challenge. The depressed woman, on the other hand, may have felt threatened by her partner's insistence and assertively engaged in order to re-affirm the relationship. Couples may have become preoccupied with delivering "relationship messages" and interpreting those of their partner. In such couples, these insistent relationship messages may have led to doubt rather than certainty; unprotected sex may be used to maintain the relationship by reducing uncertainty in the man, and increase positive feelings in the woman.

Couples with two unassertive members also showed low condom use. These couples often consisted of a male who was likely to be depressed and uncertain, and a female who was likely to show low levels of depression and uncertainty. These couples were likely to report that the conversation was harmonious. While the relationship pairing of depressed men and non-depressed women is not well studied, women may sometimes take on an emotional caregiving role in relationships that may have led them to act harmoniously rather than assertively toward a distressed partner. It is also possible these women appreciated the harmonious interactions between themselves and their boyfriends, avoiding "relationship messages" and condoms because they would interrupt what they perceived to be a positive relationship. Conversely, depressed men may have avoided relationship messages and engaged in unprotected sex as strategies to maintain the relationship, as was predicted by Uncertainty Management Theory.



Youths' use of relational messages and unprotected sex may therefore be seen as goal-directed strategies. Rather than "managing uncertainty," however, these results suggest that couples were actually "managing depression", or managing the depression of their partner. Depression alone had only a marginally significant relationship with condom use (see Table 3), but the full pattern of results suggests that dramatic differentials in partners' depression put youth at very low likelihood of using condoms, whether they are willing to send relationship messages or not. It is possible that these extreme couples had little understanding of each other's emotional state, possibly leading them to use nonverbal strategies such as unprotected sex to maintain the relationship in the absence of common emotional vocabulary. Given the high prevalence of depression in the current sample, and among high-risk youth in general, the role of depression in condom negotiation and condom use is an important area for future study and intervention.

### ***Clinical implications***

The present study has important implications for HIV prevention efforts. First, current literature focuses on assertiveness as an important component of safer sex interventions (DiClemente et al., 2010; El-Bassel et al., 2003; Melendez, et al., 2003). The present findings suggest that interventions should not only help youth make explicit verbal requests regarding condoms, but they should also teach effective and age-appropriate conflict resolution techniques. Learning to balance self-advocacy and intimacy may be particularly important for highly conflictual couples. Additionally, depression was an important factor that impacted the current results. Minority youth living in high seroprevalence environments have been shown to be at high risk for depression. It is therefore important that future intervention efforts integrate

empirically-based treatment for depression and address the impact that depressive cognitions may have on youths' relationships and condom use.

Another important implication for intervention involves youths' perceptions of their partner. Partner perceptions have been shown to influence condom use, but the present study revealed that these perceptions are often discrepant. During the debriefing portion of the current study, participants often expressed that they enjoyed participating in the study. Given their level of interest in couple interaction paradigms, ideas for future interventions include activities similar to the "Newlywed Game." For example, couples may discuss their condom use, rate each other, guess each other's ratings, and discuss their differences. Such activities may be highly engaging while also fostering open discussion between partners. They may also be used as an opportunity to teach active listening and nonjudgmental acceptance. A final implication for intervention involves the high levels of ambivalence surrounding condom use. While many youth state that they do not want to use condoms (Leonard, et al., 2011); the majority of high-risk couples in the current sample contained at least one member who had some desire to use a condom. Given that unprotected sex is a potentially life-threatening behavior, interventions should attempt to capitalize on youths' ambivalence and encourage open discussion about this topic.

### ***Limitations and directions for future research***

As discussed in the previous section, the present study may have been limited by a variety of issues including a self-selected sample, unusual operationalization of variables, and use of self-report data. Additionally, the present sample was small and may have limited predictive power; skewed distribution of variables may have led to inaccurate statistical inference.

Additionally, the primary constructs of the present study (depression and relational uncertainty)

were presented at the end of very long questionnaires; participants may have answered questions quickly rather than accurately. The cross-sectional nature of the study also limits conclusions regarding directionality. The research questions implied that conversation dynamics “led to” certain patterns of condom use. However, condom use data was collected prior to the conversation data. The conversation itself may have influenced condom use patterns in the future. Follow-up data regarding condom use would have been useful in establishing directionality of results.

One of the strengths of this study was its unique sample. The current sample was recruited at a clinic for high-risk urban youth and represents a marginalized population that is uniquely at risk for contracting HIV. Rates of multiple partnering, low education, and STI infection were high. Due to its risky status, HIV prevention research in this particular population is an important focus of research and intervention (e.g., DiClemente et al., Ober et al., 2010). However, it is possible that the current sample does not fully represent this population. As stated above, the current sample consisted only of couples that were willing to be videotaped while discussing condom use. Other samples drawn from a similar population have shown high levels of intimate partner violence, male depression, and injection drug use, none of which were evident in the present sample (El-Bassel et al., 2003; Rhodes et al., 2009; Teitelman et al., 2008). It is possible that the self-selected nature of the current sample led to a higher-functioning sample than has been seen in other studies. This may limit generalizability to other high-risk couples.

Although high-risk youth are an important area for HIV prevention and research efforts, it is also important to note that current findings and theoretical implications may not apply to youth of color or majority youth residing in less risky environments. Moreover, sexual minority

couples were not included in the current study. Given that young urban minority men who have sex with men are at very high risk of contracting HIV (Clatts, Goldsamt, & Yi, 2005), their condom negotiation strategies an urgent area for study and intervention.

A final limitation of the present study concerns lack of information about the content of the conversations. While examining the “latent” aspects of the conversation added nuance to previous research, additional information about the content of the conversation may have provided further insight into condom negotiation patterns. Future research should examine the relationships between latent and manifest content in young couples’ condom negotiation. Such information may be useful in designing intervention strategies.

Despite these limitations, the present study provides novel insights into the condom use patterns of high-risk youth. Assertiveness was shown to be a dynamic rather than linear construct, and youths’ perceptions of their partner were shown to be highly colored by their own experiences. Furthermore, the unexpected findings highlight the importance of considering youths’ condom use patterns within the context of their developmental, cultural, and socioeconomic backgrounds. Additional contributions include the lack of findings related to relationship length, and the high prevalence of ambivalence within the majority of couples. Directions for future research include: exploration of the mechanisms that link assertiveness and condom use, further refinement of the assertiveness construct, and potential methods of harnessing youths’ ambivalence toward condom use. Additionally, the “emotional mirroring” phenomenon in the present study resulted in nearly perfect correlations ( $r = .97$ ). Such a high correlation is rare, and may deserve empirical exploration in its own right. Finally, the use of an *in-vivo* condom negotiation paradigm represents an important advance in the study of youths’

condom use. Given young couples' willingness to participate in this task, this research paradigm should become an important component of HIV prevention research.

### ***Conclusion***

The present study aimed to understand how relational uncertainty impacted youths' assertiveness during condom negotiation. Although the role of relational uncertainty remains unclear, other findings related to HIV prevention were seen. Unexpected results point to the importance of considering sociocultural context when studying the condom use and relationship patterns of high-risk youth. Despite 30 years of HIV prevention research, researchers still struggle to understand the barriers to condom use among high-risk youth. The current study represents a small yet unique contribution to this challenging area of public health research.

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## Appendix A Relational Uncertainty

Items used to measure Relational Uncertainty. Previously published as the Anxiety subscale of the Experiences in Close Relationships Scale (Brennan, Clark, & Shaver, 1998) Responses range from 1 (Disagree strongly) to 7 (Agree strongly).

1. I worry about being abandoned.
2. I worry a lot about my relationships.
3. I worry that romantic partners will not care about me as much as I care about them.
4. I worry a fair amount about losing my partner.
5. I often wish that my partners feelings for me were as strong as my feelings for him or her.
6. I often want to merge completely with romantic partners, and this sometimes scares them away.
7. I worry about being alone.
8. My desire to be close sometimes scares people away.
9. I need a lot of reassurance that I am loved by my partner.
10. Sometimes I feel that I force my partners to show more feeling, more commitment.
11. I do not often worry about being abandoned (reverse-coded).
12. If I cannot get my partner to show interest in me, I get upset or angry.
13. I find that my partners do not want to get as close as I would like.
14. When I am not involved in a relationship, I feel somewhat anxious and insecure.
15. I get frustrated when my partner is not around as much as I would like.
16. I get frustrated if romantic partners are not available when I need them.
17. When romantic partners disapprove of me, I really feel bad about myself.
18. I resent it when my partner spends time away from me.

## Appendix B Depression

Items in the 8-item version of Center for Epidemiological Studies- Depression Scale (CES-D 8; Jowell et al., 2007). Responses range from 0 (None or almost none of the time) to 3 (All or almost all of the time).

- How much of the time during the past week...
- ... you felt depressed?
  - ... you felt everything you did was an effort?
  - ... your sleep was restless?
  - ... you were happy? (reverse-coded)
  - ... you felt lonely?
  - ... you enjoyed life? (reverse-coded)
  - ... you felt sad?
  - ... you could not get going?

## Appendix C

### Factor analysis used to derive Self-Reported Assertiveness (AS1) variable

During the video recall portion of the procedure, participants rated themselves on the following 5 items as part of a larger study (Welsh et al., 1999). Responses range from 0 (not at all) to 4 (very much):

1. I was trying to persuade my partner
2. I was giving in to my partner
3. I was uncomfortable
4. I was being conflictual
5. I felt connected to my partner

A factor analysis was conducted on this scale to derive an “assertiveness” variable. A sample size of 64 may be considered small for a factor analysis. However, it was considered appropriate for several reasons. First, the ratio of sample size to items was 64:5, which is approximately a 13:1 ratio and is considered acceptable by factor analysis pioneer Raymond Cattell (1978). Second, MacCallum, Widaman, Zhang, & Hong (1999) advise that for an exploratory factor analysis, the best approach is to run the analysis regardless of sample size, and examine the commonality estimates. They state that if the mean commonality among items is at least .7, a larger sample size would most likely yield the same results. For the present factor analysis, the average commonality among these items was .67. Because this value is very close to the value recommended by MacCallum and colleagues, and the factors obtained were therefore considered to be an adequate estimate of the factors that exist in the larger population.

Preliminary indicators indicated that items from this scale were suitable for a factor analysis using Maximum Likelihood Estimation and Direct Obimin rotation (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .65; Bartlett’s Test of Sphericity,  $X^2(10) = 127.18$ ;  $p = .00$ ). This factor analysis revealed a two-factor solution, and examination of the scree plot and eigenvalues indicated that two factors were statistically and theoretically appropriate. The pattern matrix is shown below (Table 5). These two factors accounted for 67% of the variance. The items loading on Factor 2 were used to create the “Self-Reported Assertiveness (AS1)” scale.

Table 8  
*Factor analysis of self-reported recall data (Pattern Matrix).*

Item	Factor	
	1	2
I was trying to persuade my partner	-0.033	<b>0.890</b>
I was giving in to my partner	0.060	<b>0.630</b>
I was uncomfortable	<b>-0.426</b>	0.200
I was being conflictual	-0.041	<b>0.954</b>
I felt connected to my partner	<b>1.004</b>	0.230

## Appendix D

### Factor analysis used to derive Partner-Reported Assertiveness (AS2) variable

The procedure used to derive AS2 was nearly identical to that used to derive AS1 (see Appendix C). During the video recall portion of the procedure, participants rated their partner on the following 5 items as part of a larger study (Welsh et al., 1999). Responses range from 0 (not at all) to 4 (very much):

1. My partner was trying to persuade me
2. My partner was giving in to me
3. My partner was uncomfortable
4. My partner was being conflictual
5. My partner felt connected to me

Like the self-report items, these partner-report items showed adequate commonality (mean commonality = .65). Preliminary indicators also showed that these items were suitable for a factor analysis (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .613; Bartlett's Test of Sphericity,  $\chi^2(10) = 104.36$ ;  $p = .00$ ). A factor analysis using Maximum Likelihood Estimation and Direct Oblimin Rotation resulted in a two-factor solution that accounted for 65% of the variance. Item loadings were nearly identical to those seen in the AS1 factor analysis (see Table 6 below). The three items that loaded on the second factor were therefore used to compute the "Partner-Reported Assertiveness (AS2)" variable.

Table 9  
*Factor analysis of partner-reported recall data (Pattern Matrix).*

Item	Factor	
	1	2
My partner was trying to persuade me	-0.110	<b>0.869</b>
My partner was giving in to me	0.162	<b>0.613</b>
My partner was uncomfortable	<b>-0.450</b>	0.241
My partner was being conflictual	-0.088	<b>0.894</b>
My partner felt connected to me	<b>0.990</b>	0.247

## Appendix E

### Inspection and transformation of study variables

A primary assumption of regression models is the normal distribution of predictor and outcome variables. Each variable was therefore examined for violations of this assumption, and transformed accordingly. To determine whether each variable was normally distributed, the following indicators were examined:

- a. Visual examination of histogram
- b. Visual examination of Q-Q plot
- c. Examination of skew and kurtosis: to be within normal limits, skew and kurtosis should be near zero and should fall within  $\pm 2$  of their respective standard errors (i.e.,  $-2(SE) < \text{Skew} < +2(SE)$ )
- d. Examination of Kolomorogov and Shapiro-Wilk test statistics: a normal distribution is assumed when these tests are not significant

If raw data violated more than one of these criteria, the following transformations were attempted, depending on the shape of the raw distribution (Tukey, 1977; Singer & Willet, 2003). Each value of X was increased by 1 prior to transformations.

- a.  $X^2$
- b.  $X^{1/2}$
- c.  $X^{1/3}$
- d. square root of  $X$
- e.  $\log_x$
- f.  $1/(X)$
- g.  $1/(X^2)$

## Appendix F Methods Used to Assess Distinguishability of Dyad Members

### *1. SPSS Syntax used to Compared Male and Female Variance Structures*

If males and females have different variance structures with respect to the outcome variable, this should be specified in the model. Differences in variance structures are compared by comparing the relative fit of two models: one that specifies identical variance structure (Compound Symmetry, or CS), and one that specifies different variance structures (Compound Heterogenous Symmetry, or CSH). Although the CSH variance structure reduces degrees of freedom by adding an additional parameter to the model (Singer & Willett, 2003), it can provide an improvement in model fit.

In the syntax below, Model 1 specifies CS and Model 2 is augmented with the CSH parameter. -2LL statistics are compared for each model to determine which one is a better fit (see below). If the CSH is a better fit for the data, it indicates that males and females should be distinguished from one another in the model, and that the CSH term should be used.

\* Model 1: Null Hypothesis

```
MIXED
  DV
  / FIXED =
  / PRINT = solution testcov
  / REPEATED = gender | SUBJECT (Couple) COVTYPE (CS)
```

\* Model 2: Augmented model specifying compound heterogenous symmetry (CSH)

```
MIXED
  DV
  / FIXED =
  / PRINT = solution testcov
  / REPEATED = gender | SUBJECT (Couple) COVTYPE (CSH) .
```

### *2. Test to Compare the Relative Fit of Two Nested Models*

The log-likelihood estimates (-2LL) of two nested models (above) can be compared in order to determine which model is a better fit for the data. Smaller absolute values for -2LL indicate a superior fit for the data (Singer & Willett, 2003). The method for comparing these values is as follows (Kenny, Kashy, & Cook, 2006):

1. -2LL of each models are subtracted. This results in a deviance value.
2. This value is compared to a chi-square distribution with one degree of freedom.
3. If it is significant, then the model with the smaller -2LL value is a significantly better fit for the data.

For these models, addition of the CSH term did not improve model fit and was therefore excluded from the final model. This suggests that males and females showed equal variance structures on the outcome measures.

### *3. Bivariate Correlations for Testing Inequality of Variance*

Variable 1 was computed:  $X_{\text{female}} - X_{\text{male}}$

Variable 2 was computed:  $X_{\text{female}} + X_{\text{male}}$

Variables 1 and 2 were subjected to a bivariate correlation. Significant results indicate an inequality of variance between genders. Nonsignificant results indicate that variance between each gender is equal. Unequal variance was not found in the present models.

## Appendix G Method Used to Calculate Effect Size

Effect size ( $d$ ) for each significant parameter was calculated using guidelines described by Kenny and colleagues (2006, p. 57, 179). When dyad members' scores on each mixed predictor are correlated at a less than .5 level, it is recommended that the following effect size calculation is used for each parameter:

$$d = \frac{2t}{\sqrt{n}}$$

where:

$d$  = Effect size

$t$  = Test statistic for each independent variable's parameter (in the final model)

$n$  = Number of individuals in the study

Note: When testing Hypothesis 1, two predictors (AS1 and AS2) were interdependent and could therefore lead to inaccurate effect size calculations. However, they were only correlated at a magnitude of .29. If this correlation is less than .5, Kenny and colleagues (2003) state that it is unnecessary to control for this interdependence.

## Appendix H SPSS Syntax Used to Test Hypothesis 1

With all terms:

```
MIXED CU WITH AS1 AS2 DEP RL DC GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= AS1 AS2 DEP RL DC GENDER AS1*GENDER AS2*GENDER DEP*GENDER RL*GENDER
DC*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(CS).
```

After pruning nonsignificant terms:

```
MIXED CU WITH AS1 AS2 DEP DC GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= AS1 AS2 DEP DC GENDER AS1*GENDER AS2*GENDER DEP*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(CS).
```

Where:

CU = Proportion of sex acts with a condom in the previous month

AS1 = Self-rated assertiveness (grand-mean centered)

AS2 = Actor's assertiveness, as rated by partner (grand-mean centered)

RU = Individual  $i$ 's relational uncertainty (grand-mean centered)

RL = Relationship length in months (grand-mean centered)

DEP = Depression (grand-mean centered)

DC = Desire to use a condom

GENDER = Gender of actor



## Appendix I

### SPSS Syntax used to test Hypothesis 2

#### Model A

With all terms:

```
MIXED AS1 WITH RU RL DEP DC GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= RU RL DEP DC GENDER RU*GENDER RL*GENDER DEP*GENDER DC*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(VC).
```

After pruning nonsignificant terms:

```
MIXED AS1 WITH RU DEP GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0,
  ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= RU DEP GENDER RU*GENDER DEP*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(VC).
```

#### Model B:

With all terms:

```
MIXED AS2 WITH RU RL DEP DC GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= RU RL DEP DC GENDER RU*GENDER RL*GENDER DEP*GENDER DC*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(VC).
```

## Appendix J

### SPSS Syntax used to test Hypothesis 3

#### Model C:

With all terms:

```
MIXED CU WITH RU RL DEP DC GENDER
  /CRITERIA=CIN(95) MXITER(100) MXSTEP(10) SCORING(1) SINGULAR(0.000000000001)
HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE) PCONVERGE(0.000001, ABSOLUTE)
  /FIXED= RU RL DEP DC GENDER RU*GENDER RL*GENDER DEP*GENDER DC*GENDER | SSTYPE(3)
  /METHOD=REML
  /PRINT = SOLUTION TESTCOV
  /RANDOM=INTERCEPT | SUBJECT (couple) COVTYPE(VC).
```

## Appendix K Methods Used to Check Model Assumptions

### *1. Normal distribution of residuals*

After running each model, residuals were examined to see whether they were normally distributed. Singer and Willet (2003) suggest examining Level-1 and Level-2 residuals. However, SPSS v.20 was used for this analysis, which does not produce Level-2 residuals. As a result, only Level-1 residuals were examined using the following techniques:

1. Examination of Q-Q plot
2. Plots of standardized residuals
3. Shapiro-Wilk and Kolomogorov-Smirnov statistics

### *2. Assumption of homoscedasticity*

After running each model, this assumption was checked by plotting raw Level-1 residuals against each Level-1 predictor (Singer & Willet, 2003). Residuals should appear normally distributed around the predictor.

## Appendix L Sample transcripts illustrating assertiveness in couples

### *1. Example of low-assertiveness couple:*

*Both partners in this couple reported very low assertiveness and agreed that condoms are never used. However, both partners rated their desire to use a condom as "very much." This interaction demonstrates how condoms are mentioned, but assertive negotiation is introduced, then avoided.*

M: We were smart, we went and got tested before we did anything.

F: True, but you know [M: at the same time} we still need to, you know, not all the time, but we need to wear them like, just in case because just so happens if I get pregnant, you know I'm saying, I'm keeping my kid.

M: [interrupts] Don't get nothing we want, isn't that what we want? We want kids thought you know I mean.

F: [interrupts] Yeah, yeah, but the situation right now is.....

M: [interrupts] I know the situation

F: is....

M: That's why honest to God, I use the [F: is....] withdrawal method. Word up. [F: yeah] Withdrawal. Word up.

F: Yeah, yeah so.

### *2. Example of moderately assertive couple:*

*This couple exhibited moderate assertiveness in both partners and reported using condoms 100% of the time. These partners manage to discuss the possibility of a future together, while still weighing the pro's and cons of condom use. A relatively lengthy portion of the conversation is included to demonstrate how harmonious and humorous interactions are used to balance disagreements.*

F: Do you ever want to try not using – Alright, wait, wait, wait. Think twice, do I want to practice safe, um, unsafe sex? Hmmmm. Not really.

M: But we talked about it.

F: We talked about it like, maybe like, tw-once.

M: Yeah?

F: So basically it's nothing and we haven't tried it before.

M: That's true.

F: So basically, hey, cause I know that if we basically don't use a condom, I will get pregnant. Right?

M: Yeah.

F: Or we could get anything. But since we the only two people that if we sleep with each other we don't sleep with anybody else so we don't know how we're not might not get something or we might get something. We don't know, We don't know.

M: [laughs]

F: We don't know. But anyway, I know Tatia use condoms. Sometimes.

M: Sometimes. Sometimes it's important to use a condom cause there's a lot of diseases that's out right now

F: Exhibit A, Toshedo [says a friend's name]

M: Yeah. And there was mad, they had mad diseases on that thing that I ain't never heard of.

F: What?

M: What was it?

F: Oh, oh I told you Toshe got one of them already so please

M: No, they, they had diseases on there that I ain't never heard of.

F: Well too bad none of us have it, so that's, think, that's why we don't have it. Actually we have to take a test to see if we have it or not. That's the thing. Oh. Ohhhhh.

M: [laughs] What are you doing?

F: I don't know what I'm doing it. I'm in camera shock. I do not know why I am doing this. [both are laughing] I don't know anybody that doesn't use a condom, seriously.

F: Oh, I do, my brothers.

M: Umm.

F: Sometimes, they don't. Sometimes they do. Sometimes they don't because they say they know when they are about to come. So basically they don't need condoms, they don't need protection. I'm like you have a pre-come. They're like "What? I know when pre-come comes so I take it out then pre-come [laughing], then stick it back in." Like it's not

M: Yeah, usually you can feel it when that comes.

F: You don't!

M: I'm, maybe I'm different. I don't know!

F: Okay, not all guys feel, fee, ah, ah, ah, [gets tongue tied]

M: [laughs]

F: feel pre-come. Not all guys do. So that means you don't.

M: Well, I guess sometimes I do. Sometimes I don't.

F: You don't all the time!

M: All the time?! I never said that! Sometimes I do.

F: Anyways, anyways, anyways, anyways. Are we even going to try having sex without condoms?

M: [interrupts] Well, we could try...

F: Or are we going to end up with a baby?

M: Yeah, that would be the only time we ever try unsafe sex.

F: Wait a minute. You said we'd try unsafe sex for so many times.

M: No you was the one [F interrupts and talks over] that tried saying that

F: No, because you said, no you said that if we lived together why do we need a condom for we could have like 20 babies or whatever umm,

M: [interrupts] I said if we were married. I said if we were married!

F: Even if we're married we'll need condoms.

M: Why?! We can do it [cornrow?] style.

F: You nymph! [both laugh] You nasty. I said [unintelligible]

M: I was ah,

F: What?

M: Why not? We both married. We both know each other.

F: So? Does it look like I want to be popping out babies every single time?

M: It's not like every time.

F: Whatch you mean it's not like every time?

M: What? There's like, they have all this stuff like birth control. Doesn't that stop like getting pregnant?

F [interrupts]: Eww. But does it look like I want to be taking pills every single time? Ahh..  
 M: It's better than that than having  
 F: a kid.  
 M: But what if we don't have a condom and we have the urge to have sex, right?  
 F: Course we're always going to have a condom in the house. Look at me [laughing] I will have condoms in the house every single time. [M laughs]

3. *Example of a highly assertive couple:*

*Both partners reported high assertiveness throughout this interaction. Low condom use and low desire to use a condom were also reported by both partners. The male's responses to the computerized survey indicate that he has cheated on his current partner. The following interaction demonstrates how consistent assertiveness may have interfered with conflict resolution. Unprotected sex may be used to re-affirm the relationship.*

M: So if you was ever to play me [cheat on me] you wouldn't use a condom?  
 F: yeah I would.  
 M: Umm.  
 F: I would. I bet I would.  
 M: Use a condom?  
 F: Yeah. Would you use a condom?  
 M: Um hm.  
 F: Yeah why? Why would you use a condom?.... and I could get pregnant if I don't use a condom. So I don't want to be pregnant with somebody else.  
 M: So, have you did that already?  
 F: No. Have you?  
 M: So you're going to lie.  
 F: [laughs]  
 M: You played me. I know you did... have you played me yet?  
 F: No! [raises voice] C'mon shut up! You know we're not supposed to be-- I haven't played you!  
 M: Why don't I believe you?  
 F: [laughs] Have you played me? You and your little dumbs friends are players.....  
 M: I hate you. Nah, I'm playing. I love you.  
 F: [whispers] I love you, too.