Maternal-Fetal Attachment, Temporal Orientation and Locus of Control:
Implications for Prenatal Care Behaviors and
HIV Risk Reduction during Pregnancy

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Pregnancy presents an important time in a woman’s life for added HIV prevention behaviors as HIV exposure during pregnancy could lead to delivery of an infected infant. Unfortunately, pregnancy is generally regarded as a time when HIV preventative behaviors, specifically condom use, decrease as most women report using condoms specifically for pregnancy prevention. Maternal fetal attachment (MFA), a characteristic which describes the relationship between a pregnant woman and her developing fetus has been shown to be positively related to health promotion behaviors during pregnancy. Similarly, temporal orientation and health related locus of control (LOC) have also been shown to increase HIV preventative behaviors, although these have never previously been tested in pregnant women. One hundred low-income, minority women (81% Non-Hispanic Black) were recruited from the waiting room of an urban prenatal care clinic in order to test the hypotheses that higher levels of the aforementioned variables are associated with better adherence to prenatal care behaviors and HIV prevention behaviors as measured by condom use during pregnancy. Findings revealed that while MFA had a significant moderating effect on the relationships between LOC and prenatal health behaviors and temporal orientation and prenatal health behaviors, respectively, the same conclusions could not be drawn between these variables and HIV prevention behaviors as measured by condom use during pregnancy. It should be noted that while the majority of
the women in the study discontinued condom use once pregnancy was confirmed they reported engaging in other HIV preventative behaviors including decreasing the number of sexual partners and frequency of sexual contact during pregnancy. Clinical implications and directions for future research to clarify some of these findings are discussed.
1. INTRODUCTION

Young women of childbearing age are currently the fastest increasing group of new HIV infections. The majority of these women contract HIV from their male partners. Pregnancy is an important time for HIV prevention behaviors as many women discontinue condom use once the contraceptive motivation is gone. What women may not realize is that in discontinuing condom use they put themselves and their unborn children at risk for contraction of STDs and HIV if they remain sexually active. There are many personal attributes that predict adherence to HIV risk reduction behaviors including temporal orientation and health related locus of control. The current study investigated whether maternal-fetal attachment, a characteristic specific to pregnancy, favorably influences pregnant women’s other personality characteristics such that they might be more inclined to engage in positive prenatal health behaviors as well as preventative HIV risk reduction behaviors. It must also be acknowledged that the main recommended HIV risk reduction behavior, condom use, cannot be performed in isolation; a woman needs her male partner to cooperate. To that end, a woman’s level of power within her relationship was also investigated to examine how this variable interacts with maternal fetal attachment in the prediction of condom use during pregnancy.

1.1 HIV Epidemiology

The United States’ Center for Disease Control and Prevention reports that AIDS and other AIDS related illnesses are currently the leading cause of death among black women 25-44 years of age and the sixth leading cause of death among adolescents and all women aged 25–34 years many of whom were likely infected before the age of twenty-
five (CDC, 2007). Among men, HIV is the second leading cause of death following unintentional injury (Selik, Chu, & Buehler, 1993).

During the years 2004 to 2007, the estimated number of HIV/AIDS cases increased by 15% among the 34 states that have long term name based reporting of new HIV infections (CDC, 2009). Despite an overall decrease in the national incidence of HIV/AIDS from 2000 to 2003 (CDC, 2005), the overall HIV infection incidence rose 15% between 2004 and 2007; rates for men infected by risky heterosexual contact increased by 9% while rates for women rose 14% (CDC, 2009).

Women are especially at risk according to the Centers for Disease Control and Prevention; in 1998 it was reported that the number of AIDS cases among United States adolescent and adult females had surpassed 100,000 (CDC, 1998). By 2003, the Center for Disease Control had estimated close to 300,000 women living with HIV/AIDS in the United States out of roughly one million infected persons (Glynn & Rhodes, 2005). In 2007, women constituted 28% of HIV/AIDS cases in the United States; approximately 62% of those cases were among non-Hispanic black women, and 16% were among Latinas (CDC, 2009).

1.2 Heterosexual Transmission

Heterosexual transmission of HIV, the virus that causes AIDS, may occur when a partner in a heterosexual relationship who is already infected with the virus has unprotected vaginal, anal, or oral sex with the other uninfected partner of the opposite sex. HIV is present in seminal fluid as well as vaginal and cervical secretions. During and following intercourse, viral particles are able to penetrate tiny tears or sores in the vaginal, rectal, penile, or urethral mucosa. Women are twenty times more likely than
men to become infected with HIV through vaginal intercourse, probably because of the prolonged exposure of the vagina, cervix, and uterus to seminal fluid.

Sexually transmitted infections (STIs) are also likely to increase the risk of heterosexual transmission of HIV. Microbes such as *Treponema pallidum*, herpes simplex, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae* are known to cause erosions in the mucosa and may even increase the concentration of HIV in seminal or vaginal fluid. Oral sex, however, is much less likely to result in HIV transmission (Gladwin & Trattler, 2004).

Some of the key risk factors associated with heterosexual transmission of HIV/AIDS are frequent change of sexual partners, unprotected sexual intercourse, previous presence of sexually transmitted infections with poor access to treatment, lack of male circumcision, social vulnerability of women and young people, and political or economic instability in the community (Lamptey, 2002). It is important to note that while many of these factors pertain to the individual, others still pertain to societal factors that are out of the individual’s control (Lamptey, 2002).

Among women, heterosexual transmission is the most common cause of new HIV infections. Of the estimated 123,000 women living with AIDS, 71% were determined to have been heterosexually exposed to the virus as opposed to only 13% of the 332,500 infected adult and adolescent males (CDC, 2005). It has been well documented that the receptive partner during sexual intercourse is at greater risk for disease infection than the insertive partner (Anderson, 1999; Gladwin & Trattler, 2004).
1.3 Women as a Vulnerable Population

Vulnerability refers to individual and societal factors that increase the risk of HIV infection. Societal factors include poverty, unemployment, illiteracy, gender inequities, cultural practices, lack of information and services, and human rights abuses (UNAIDS, 1996). These factors greatly increase the vulnerability of women, young people, and other minority groups (Lamptey, 2002). Poverty is especially important in assessing the vulnerability of a population as many studies have noted that low-income women are at increased risk for HIV/STD infection and unintended pregnancy. Finer and Henshaw (2006) report that the unintended pregnancy rate is highest among young (18-24 year old), low-income, minority women. Poverty is often related to unemployment, lack of education, and little or no access to basic health care. Additionally, women living in poverty are more often involved in violent relationships with men than their middle or upper socioeconomic class counterparts (Campbell, 2002). The consequences of living in poverty, such as having a partner who uses intravenous drugs and being a victim of intimate partner violence often increase the risk for HIV infection. These problems associated with poverty are elaborated on below.

1.3.1 Minority Women Living in Poverty

Black and Hispanic women are among those who are most likely to be living in poverty. Economic inequalities occurring since the 1990s have shaped the distribution of HIV infection and HIV-risk among women. Zierler and Krieger (1997) reported that in 1994 13.1% of white women, 33.7% of black women, and 33.4% of Hispanic women were living below the national poverty line, with the degree of poverty experienced by
the minority groups being more extreme than that experienced by white populations and for households headed by women than those headed by a married couple.

Low income minority women have been found to be at highest risk for new HIV infection. Escalating rates of AIDS cases among minority women are particularly striking, with rates for blacks and Hispanics being 20 and 7 times greater than rates for whites, respectively (CDC, 1997; Crosby, Yarber, & Meyerson, 2000).

1.3.2 Women as Partners of IV Drug Users

Hobfoll and colleagues (1994) suggest that minority women and inner-city women in general are at increased risk for HIV/AIDS infection due to the rate of exposure among those they are likely to have as sexual partners and because of the higher than average prevalence of intra-venous drug users in the inner city (CDC, 1991). Residents of impoverished communities were and continue to be vulnerable to the temptation to use illegal drugs for relief and stimulation (Zierler & Krieger, 1997). These neighborhoods tend to have a higher prevalence of drug use which includes drugs such as crack, cocaine, and heroin which are linked to the risk of HIV infection (Zierler & Krieger, 1997).

In the United States, 19% of the 332,578 HIV/AIDS cases diagnosed in men as of 2004 are among those whose only risk factor is intravenous drug use (as opposed to men who have sex with men (MSM), heterosexual contact, and MSM and intravenous drug use (IDU)) (CDC, 2005). Predominantly men, intravenous drug users occupy a critical position in the spread of the HIV/AIDS epidemic due to their association among other groups who would not otherwise be at risk, such as their female sexual partners (Booth, Koester, Brewster, Weibel, & Fritz, 1991). As of 2004, unprotected heterosexual sex
with an injection drug user accounted for 14% (24,568) of all cumulative female AIDS infections, compared to only 1% (11,048) of all cumulative male AIDS infections (CDC, 2005).

1.4 Pregnant Women

It is important to study pregnant women in the context of HIV/STI prevention because pregnant women are not exempt from participation in high-risk sexual behaviors and STI infection both during and following pregnancy (e.g., Ickovics, Niccolai, Lewis, Kershaw, & Ethier, 2003; Meade & Ickovics, 2005). Empirical findings indicate that most young adults use condoms primarily for pregnancy prevention as opposed to STD prevention (Cooper, Agocha, & Powers, 1999). Condom use is therefore often abandoned once a pregnancy is established because the contraceptive motivation no longer exists (Crosby et al., 2002). In an earlier study by Levine Kornfield & Geller (manuscript in preparation) the authors confirmed Crosby and colleagues’ findings. They found that among a sample of 67 pregnant women, self-reported frequency of condom use decreased significantly from 59% in the 3 months prior to becoming pregnant to only 23% during pregnancy. Young pregnant women may also be an important and unique group on which to focus because pregnancy is known to be a stressful transition period for the mother-to-be as well as her partner. The stressors of pregnancy can strain a relationship which may influence sexual risk behavior (e.g., Bost, Cox, Burchinal, & Payne, 2002; Dulude, Belanger, Wright, & Sabourin, 2002). One of these stressors may be the unplanned nature of the pregnancy itself. Young women, especially those living in low-income communities are likely to become pregnant with unplanned pregnancies (Finer & Henshaw, 2006). These authors found that in 2001, the rate of unplanned
pregnancy was highest among women aged 18-24, unmarried women, low-income women, and minority women. Additionally, between 1994-2001 the rates of unplanned pregnancies increased among poor and less educated women (Finer & Henshaw, 2006). In a previous study of women recruited from the same population as was recruited in the current study, Levine Kornfield and Geller (manuscript in preparation) found that 52 of the 67 women sampled had not planned their pregnancies. Of these women carrying unplanned pregnancies, 53.8% reported that the pregnancy was mistimed (too soon) and 25% stated that they had not wanted any future pregnancies at the time they became pregnant (i.e., they did not want any children at all, or had considered their childbearing complete). This can have implications for the parents as young couples may be still developing a romantic relationship when they unexpectedly need to focus on pregnancy, childbearing and childrearing. This transition to parenthood can cause conflict and tax the partnership (Florsheim et al., 2003).

1.5 Maternal-Fetal Attachment

Maternal-fetal attachment (MFA) is a term used to describe the developing relationship between a pregnant woman and her fetus (Salisbury, Law, LaGasse, & Lester, 2003). The term was coined by Cranley (1981) who stated that MFA describes “the extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child” (p.282). These prenatal maternal behaviors may include certain actions used to bond with the unborn child such as assigning pet names, making reassuring comments, talking affectionately or endearingly towards the baby, and carrying on imaginary conversations with a partner and the fetus (Leifer, 1977). In a study by Stainton (1985) the author interviewed pregnant women and found that these
women communicated with their fetuses and perceived that their unborn children had already developed individual personality characteristics and could be interacted with while in utero. In a later study examining attachment to the fetus, Stainton (1990) found that expectant mothers believed that their unborn babies also participated in the attachment process by responding to maternal behaviors by moving towards the mother’s touch or becoming calmer when the belly was patted or rubbed. The author’s conclusions included the suggestion that MFA is largely an individual process influenced not only by the mother’s own personal history but also by her whole experience of the pregnancy (Stainton, 1990).

There has also been evidence to suggest that MFA increases as the pregnancy progresses (Grace, 1989). Researchers examined 69 pregnant women monthly during their pregnancies by having them complete the Maternal-Fetal Attachment Scale (MFAS) developed by Cranley (1981). Results indicated that MFA increases over the course of the pregnancy as the MFAS correlation coefficients increased significantly from .55 at 16-28 weeks gestation to .95 at 36-40 weeks gestation (Grace, 1989). MFA also has significant implications for maternal-infant bonding in the postpartum period. Fuller (1990) examined 35 pregnant women in a longitudinal study aimed at discovering how MFA influences postpartum bonding. Pregnant women completed the Maternal Fetal Attachment Scale between 35-40 weeks gestation. After giving birth these women were examined again while feeding their infants and mother-infant interactions were measured with the Nursing Child Assessment Feeding Scale and the Funke Mother Infant Interaction Assessment. Findings suggest that mothers with higher prenatal levels of
MFA were more likely to score higher on the subsequent measures of infant attachment (Fuller, 1990).

Erickson (1996) reviewed the studies described above and concluded that the participants who were included in these research studies were mainly white, well-educated, married women with normal pregnancies. This highlights the point that few studies have been conducted on how MFA progresses or influences women from a lower SES, minority ethnicity, or lower educational level.

MFA has also been shown to have a positive relationship with health promotion behaviors during pregnancy such as smoking cessation, abstaining from alcohol and illicit drugs, obtaining prenatal care, appropriate weight gain, establishing good rest and sleep patterns, getting adequate exercise, and learning about pregnancy and childbirth (e.g., Lindgren, 2001). Reading, Campbell, Cox, and Sledmere (1982) suggested that MFA might increase participation in beneficial health practices during pregnancy; however other researchers (i.e., Lindgren, 2001) propose that conversely, good health practices may actually lead to stronger MFA. Lindgren (2001) states that women who are more attached to their fetuses are thought to be more interested and invested in caring for themselves during pregnancy in an attempt to improve the health outcomes for their future child.

Lindgren’s (2001) study showed that high levels of MFA predicted positive health practices among a group of 252 expectant mothers. Interestingly, her findings revealed that women with higher education levels and who were married were more likely to engage in positive health practices. However, the women sampled in this study were mostly white, married women with a vocational or college degree earning upwards of
$50,000 a year. When investigating HIV risk reduction behaviors in the context of MFA, it is important to consider women who are currently at highest risk of contracting HIV. The sample described by Lindgren and other abovementioned researchers, does not adequately capture this group which tends to be predominantly comprised of minority women (Black or Latina) living in poverty. Lindgren (2003) later conducted another study of MFA and pregnancy health practices, examining the differences between a group of inner-city pregnant women (n= 55) and a comparable group of women living in a small urban area in the Midwest. (n= 197). Her findings indicated that there were no significant differences in MFA between the two groups, although women living in the inner-city engaged in significantly fewer health practices during pregnancy. Interestingly, inner-city women with low MFA scores were found to have lower levels of health practices than women with higher scores on MFA, but the relationship between site and health behaviors was moderated by attachment. This indicates that although inner-city women are less likely to engage in positive prenatal health behaviors overall, those with higher scores on MFA are more likely to overcome the challenges that inner-city living presents for this endeavor. This is important as the current study examined both of these constructs (e.g., MFA and prenatal health behaviors) in a sample of pregnant women living in inner-city Philadelphia. What Lindgren did not address in her study was whether the women she surveyed were at risk for HIV infection and how this may influence prenatal care behaviors. Minority women living in inner city Philadelphia are at increased risk for HIV due to their minority and gender status coupled with the fact that Philadelphia is an HIV epicenter (Fife & Mode, 1992). The current study will examine whether MFA has any effect on whether or not these women engage in HIV risk
reduction behaviors during pregnancy in addition to other positive prenatal health behaviors.

1.6 Health Related Locus of Control

Locus of control was originally studied by Rotter (1954) in connection with his social learning theory, which states that the likelihood of behavior is a function of two issues. The first is the extent to which the individual believes the behavior will lead to a particular reinforcement and the second is the extent to which the reinforcement is valued by the individual. An extension of this work argued that social learning theory could be applied on a more general level, dividing individuals into two categories: internal and external. Rotter (1966) posited that ‘internals’ were more likely to attribute consequences of events to their own actions, while ‘externals’ believe that these events are outside of their own control. Wallston et al., (1978) later applied this directly to health related events and behaviors and created the Multidimensional Health Locus of Control Scale to measure health-specific locus of control along three separate dimensions. These three dimensions were originally proposed by Levenson (1978) and include the extent to which individuals believe that their health related outcomes are 1) a result of their own actions, 2) under the control of powerful others, or 3) due to fate or chance. Norman and colleagues (1998) predicted that individuals with strong internal health related locus of control beliefs would be more likely to engage in health promoting activities and behaviors while those with external loci of control related to chance or fate will be less likely to do so. These authors also state that those with a strong belief in the ‘powerful others’ dimension will be more difficult to predict as they may be influenced by messages from medical professionals to do something about their health or may
believe that medical professionals can cure their illnesses and be less motivated to engage in positive or preventive health practices. These authors’ predictions were largely verified in a sample of 11,632 from a community setting. They found that all three of the health locus of control dimensions correlated significantly with scores on their self-developed health behavior index. Individuals who engaged in more health behaviors (not smoking, using alcohol within recommended limits, exercising more than 20 minutes per day, 3 times per week, and eating fruit 6-7 days per week) were more likely to score higher on the internal dimension and lower on the powerful others and chance dimensions (Norman et al., 1998). Norman and colleagues (1998) also found evidence suggesting that the value one places on his or her own health may moderate the relationship between health locus of control and engagement in health behaviors. This may be relevant to the current study being proposed as pregnant women may place a higher value on their own health in an attempt to secure the health of their unborn child.

In the current study, value on health will be measured as the extent to which the pregnant woman values the pregnancy (i.e., attachment and attitude towards the pregnancy). In terms of family planning behaviors specifically, there has been some interesting findings which may be challenged in the current study. For example, Fisch (1974) found that in a sample of “poor black women” there were no significant differences in locus of control between women who were deemed to be effective versus ineffective family planners. Overall, Fisch (1974) concluded that these women were highly external. Perhaps this can be attributed to the communities in which women living in poverty often live where they may not have very much control over access to health care and therefore may be more likely to perceive that preserving their own health is out of their own hands.
In 1990, when AIDS infection was becoming an epidemic in gay male communities, Kelly and colleagues conducted a study investigating health locus of control as related to risky sexual practices in this population. They revised Wallston and colleagues’ (1978) original multidimensional health locus of control (MHLOC) scale to be more relevant to HIV/AIDS as a health risk. Nine items representing the original three dimensions were tailored to make them pertinent to HIV/AIDS. Their findings indicated that gay men who did not engage in unprotected anal sex were less likely to attribute AIDS risk to external factors such as chance, luck, or fate. More recently, Burns and Dillon (2005) used Kelly and colleagues’ (1990) AIDS MHLOC scale in a sample of 106 African-American undergraduate students and found that AIDS related locus of control did not significantly predict condom use. Authors have concluded that perhaps AIDS health locus of control is too global a construct to predict the specific behavior of condom use (Burns & Dillon, 2005; Glaser, 1995). Two studies have been conducted looking at condom use and AIDS health locus of control but neither has captured a sample that is similar enough to make conclusions about the proposed sample for this study. As mentioned above, Kelly and colleagues (1990) examined the behavior of gay men, and Burns and Dillon (2005) investigated the same relationships among black college undergraduates. Interestingly, these authors found conflicting outcomes which makes generalizability very difficult. Pregnant women have different issues to deal with in their lives than either of these two samples, so it is important to continue to investigate these issues among this unique group of women.
1.7 Temporal Orientation (Time Perspective)

Jones (1993) defined temporal orientation as the predominant cognitive, affective, and behavioral orientation to either the past (“dwelling in the past”), the present (“living for now”), or the future (“always planning for tomorrow”). The construct of temporal orientation has been conceptualized in many different ways according to different researchers who examine it (Burns & Dillon, 2005). Some researchers classify temporal orientation as a personality characteristic (e.g., Raynor & Entin, 1982; Strathman et al., 1994) while others conceptualize it as a cognitive schema (Tobacyk & Nagot, 1994). Regardless of this discrepancy, temporal orientation has been generally accepted to refer to the time perspective that guides, motivates, and influences an individual’s actions and goals (Henson et al., 2006). While all three different time perspectives have been researched in relation to health behaviors, a temporal orientation to the past has suggested little explanatory value among the behavior of young adults (the population of interest in this study) (Henson et al., 2006). As a result the majority of research that has been done with young adults has focused primarily on a temporal orientation to the present or the future. To elaborate on the definitions provided above, present time perspective refers to a primary orientation to the here and now that leads to an inclination to form goals and perform behaviors that meet immediate desires. Henson and colleagues (2006) report on two different types of present orientation which are theorized to lead to different outcomes for the individuals that espouse them. These are hedonistic present time perspective, which evokes immediate, pleasure-oriented goals, and fatalistic time perspective, which is typified by general pessimism and self-destructive behavior. Conversely, individuals with a more future oriented time perspective are more likely to
refrain from immediate pleasure in order to focus on long-term rewards (Boyd & Zimbardo, 2005). Time perspective or temporal orientation has long been studied in relation to the performance of health behaviors. The overarching finding has been that present time perspective is closely linked to and predicts risky health behaviors while future time orientation is linked to the performance of fewer risky behaviors (Henson et al., 2006). In a study of driving styles, findings indicated that present time orientation was positively correlated with risky driving behaviors, while future oriented individuals showed much lower levels of risky driving (Zimbardo et al., 1997). Similarly, in two different studies of substance abusers, the authors reported that individuals with present time orientations were significantly more likely to be heavier users of illicit substances, while those with a future time orientation reported less substance use (Keogh et al., 1999; Wills et al., 2001). In the same vein, Rothspan and Read (1996) reported associations between present time orientation and frequent sexual behavior with more sexual partners and future time orientation and delayed onset of sexual behavior with fewer sexual partners. Additionally, a temporal orientation to the future has been shown to correlate positively with condom use (Burns & Dillon, 2005; Dillorio et al., 1993) and exercise and healthy eating (e.g., Mahon et al., 1997). Burns and Dillon’s (2005) study on African American college students revealed that individuals with greater future time orientations showed greater probability of condom use. The authors further note that this was seen especially among the women sampled in their study in that women with stronger future orientations exhibited more frequent current and past condom use during sexual activity than male students. While this is one of the first studies to examine this construct among a group of African American young adults, undergraduate students are likely extremely
different from the sample that will be recruited for the current study. A student sample may be quite different than a community sample even if they have similar racial and demographic characteristics.

While many studies have investigated temporal orientation as a precursor to behavior, Padawer and colleagues (2007) questioned why so few studies have examined the antecedents of future time perspective. Because of the dearth of research in this area, these researchers conducted a study to investigate the link between time orientation and demographic variables including age, education level, income, marital status, and sex. The authors reported that four of these five demographic indicators covaried significantly with future time orientation. Stronger future orientations were more likely to be found among individuals who had higher incomes, were older, were male, and were more highly educated. Marital status did not significantly correlate with future orientation. Interestingly, results differed by age for men and women. Older men and women both showed a modest relationship between education level and future time perspective; however young women differed in that their education level did not significantly relate to future time orientation. This has significant implications for the current study as the proposed target population to be sampled is primarily young, female, less educated and low-income. Padawer and colleagues’ research shows that the sample intended to be collected are significantly less likely to be oriented to their own futures. What is interesting about this study is that pregnant women were not included in this sample and so while generalizations can be made about young, low-income, less educated non-pregnant women, the question remains as to whether these same conclusions can be applied to women who are currently expecting a child. The reasoning here is that women
who are pregnant have a specific future date to which they may be oriented as they anticipate the birth of their child. Therefore, pregnancy may be a time during which temporal orientation shifts towards the future.

1.8 Power in Romantic/Sexual Relationships

The balance of power in romantic and sexual relationships has been found to have consequences for individuals engaged in these types of relationships (Felmlee, 1994). Some examples of these types of consequences include general psychological well-being, relationship satisfaction, and level of conflict within the relationship. A study by Horwitz (1982) found that men and women who occupied more powerful roles in their relationships experienced lower levels of psychological distress than did those who reported less power than their romantic partner. A number of similar studies find that a more equal balance of power is associated with higher levels of relationship satisfaction (Gray-Little & Burks, 1983). Additionally, other research suggests that power imbalances are more highly related to increases in conflict in a partnered dyad. In a study of lesbian couples, Caldwell and Peplau (1984) found that those women who perceived an inequitable balance of power anticipated a greater number of problems or difficulties than those with more equitable relationships.

Despite these findings indicating that unequal power distribution can cause problems for the relationship, our society is still one in which males most often dominate in relationships and otherwise. Gender-based power is derived from the social norms that accompany the biological differences between men and women and refers to the societal expectations about appropriate gendered behavior (Blanc, 2001; Gupta, 2000). Blanc
(2001) states that gender-based power in sexual relationships is frequently unbalanced and that women usually have less power than men.

Power in romantic and sexual relationships has been defined in a variety of ways (Blanc, 2001). According to past feminist literature, gender affects both the “power over” and “power to” (Riley, 1997). According to Riley (1997) “power to” refers to the ability to act, while “power over” refers to the ability to assert wishes or goals even in the face of opposition from a significant other. Pulerwitz and colleagues (2000) state that for the purposes of studying the role of power in sexual relationships, the “power over” construct refers to one partner’s ability to act independently of the other, dominate the decision-making, engage in behavior against the other’s wishes, or to control a partner’s behavior or actions. Blanc (2001) notes that it is not the absolute power of one member of the dyad that is important, rather it is the “comparative influence of each partner relative to the other.”

In the Boston Dating Couples study conducted by Peplau (1979; 1984; Peplau & Campbell, 1989) the author found that less than half of both male and female respondents reported that their relationships were equally balanced in terms of power. Among the participants who reported a discrepant power balance, the majority perceived the man to hold more power in the relationship. Another more recent study confirmed these findings by Peplau and colleagues. Felmlee (1994) enrolled 413 heterosexual dating individuals in her study of power dynamics in romantic and sexual relationships. Her findings indicated that less than half of the dyads reported an equitable balance of power. In couples where there was a recognized imbalance of power, the author found that the man in the couple was more likely to be viewed as the dominant partner (Felmlee, 1994).
These findings have significant implications for women in imbalanced partnerships especially in the current age of the HIV/AIDS epidemic. In cases where women have less power than their male partners, those women in communities where HIV/AIDS is prevalent are at higher risk for contracting these infections. A woman’s ability to negotiate safer sex practices with her partner is a critical component of HIV/STD prevention strategies (Pulerwitz, Amaro, DeJong, Gortmaker, & Rudd, 2002) and is influenced by both her and her partner’s level of power in the relationship. Researchers examining condom use have proposed that these types of gender-based imbalances of power can restrict a woman’s capacity to negotiate safer sex through condom use (e.g. Amaro, 1995; Bowleg et al., 2000; De Bruyn, 1992; Ehrhardt et al., 1991; England, 1997; Felmlee, 1994; Gage, 1997; Gomez, et al., 1996; Heise et al., 1995; Monahan et al., 1997; Pulerwitz et al., 2002; Wingood, et al., 1998). Amaro & Gornemann’s 1992 study examined 69 focus groups comprised of Latinas living in the United States and found that the issues of power and condom use created a major obstacle to HIV risk reduction behaviors in three fourths of the groups. This is important and troublesome as women must rely on cooperation from their male partner in order to successfully use a male condom during sexual contact (Campbell, 1995). Pulerwitz and colleagues (2002) acknowledge that not much research has been done in the area of relationship power and its relationship with condom use. Due to the dearth of knowledge on that topic and the use of unvalidated measures in the few previous studies that had been conducted, the authors created and validated the Sexual Relationship Power Scale (Pulerwitz et al., 2000). They then used this scale to test the hypothesis that relationship power constitutes a key factor in condom use negotiation. Their findings indicated that
women with high and medium levels of power in their romantic and sexual relationships were significantly more likely to report consistent condom use than women with low levels of power. In fact, women with high, medium and low power in their relationships reported declining rates of condom use. Women with high power reported that they were 5.96 times more likely to use condoms and women with medium power were 3.66 times more likely to use condoms (Pulerwitz, et al., 2002).

1.9 Female Condom Use

The female condom was approved for use by the Food and Drug Administration in 1993 as a female-controlled method to prevent unintended pregnancies and HIV and other STDs (Gollub, 2000). In a 1994 study to determine the contraceptive efficacy of the female condom among 328 participants over 6 months, the accidental pregnancy rate was in the same range as other recommended barrier methods. In addition, the female condom has the added benefit of preventing STIs including HIV (Farr, Gabelnick, Sturgen, & Dorflinger, 1994). Due to these and other favorable study results, many policy-makers, public health agencies, community based groups and individual practitioners both in the United States and internationally have advocated the use of the female condom for its intended purposes (Gollub, 2000). Research trials with the female condom have suggested that there is a high level of interest in this method and that its use is feasible in high-risk populations. Some of the most liked features of the female condom include the fact that women can place it autonomously and trust that it is not torn or otherwise sabotaged by a partner, the high level of protection it affords when used correctly, and its soft and lifelike feel. The features of the female condom that are most unappealing to women in high-risk populations are the need to practice insertion before
use, the fact that it can be seen by the partner (because it hangs outside of the body), and for some, the discomfort of the inner ring (Gollub, 2000).

The availability of the female condom can be empowering for some women. Before its inception, a woman’s only option for protecting herself from unintended pregnancy and STDs in case of her partner’s refusal to use a male condom was to refuse sex altogether. This was often problematic however in the context of a relationship; refusal can be perceived as antagonistic, and there may have been the possibility or threat of violence. The female condom can be used as a tool by a woman in the non-threatening negotiation between partners (Gollub, 2000).

1.10 Power in Relationships and Partner Refusal to Use Condoms

Partner refusal is an especially important deterrent to actual condom use among those women who have high condom use intentions because of financial dependence on their male partner, social norms that discourage an active role, and even fear of physical violence. Because impoverished women often live in communities where HIV and STD prevalence is high, barriers to consistent condom use can put them at especially high risk of infection (Santelli et al., 1996). Heterosexual relationships are often characterized by adherence to traditional gender roles and power inequalities that create an environment in which men have greater or absolute power in the safer sex decision-making arena. This is especially true in high-risk heterosexual communities (Exner, Gardos, Seal, & Ehrhardt, 1999). In a study of 362 primarily African American women living in Miami, Florida, 56% of the participants had a main partner resist her condom use attempt. Fourteen percent of that group of women had a partner ignore her, 22% had a partner argue with her, 28% had a partner who thought the woman was accusing him of having a
disease, 24% had a partner who thought the woman was having sex with others, and 45% had a partner who thought the woman was accusing him of having sex with others (Perrino, Fernandez, Bowen & Arheart, 2005). Levine Kornfield & Geller (manuscript in preparation) found that pregnant women who had experienced a partner’s refusal to use condoms were significantly less likely to actually use condoms. The authors posit that this could be due to a woman’s partner indicating he would not allow condom use or to the woman herself learning from past experience that it upsets her partner to even ask.

Interestingly, other studies show that women are more likely than men to actively initiate condom use and initiative on the part of the female partner regarding condom use is extremely important in actually achieving condom use (Troth & Peterson, 2000). Women report that requesting condom use within an established relationship often creates conflict stemming from accusations about fidelity and STIs, or complaints about loss of sexual pleasure (Neighbors, O’Leary & Labouvie, 1999).

Some feminists posit that asking women to initiate and insist upon condom use by their male partners causes men to view the condom as an interruption of the “normal” and “natural” practice of unsafe heterosexual sex (Vitellone, 2002). Women’s responsibility for condom use is understood to challenge the spontaneity that often characterizes sex between a man and a woman and can be seen as feminizing the true masculinity of heterosexual sex (Vitellone, 2002). Other literature cites more straight-forward reasons that men do not like to use condoms such as discomfort, loss of sexual pleasure, and interruption of the spontaneity of the sexual act leading to a loss of erection.
1.11 HIV/AIDS Risk Perception

Many minority women feel that they are not personally at risk for HIV infection. According to a study conducted by Kalichman, Hunter, and Kelly (1992), minority women reported less concern about contracting the virus that causes AIDS and they estimated their personal risk to be lower than did nonminority women. Similar to gay men at risk for HIV infection, women in this study showed an optimistic bias, defined as perceiving their own risk to be less than that of others, which may help explain why women (especially those who are labeled high-risk) are unlikely to use condoms (Helweg-Larsen & Shepperd, 2001; Kalichman, Hunter, & Kelly, 1992). More recently, investigators Takahashi, Johnson, and Bradley (2005) found that in a study of 2,911 sexually active adults who completed the Sexual Behavior Module of the 2000 Behavioral Risk Factor Surveillance System nationwide survey, among the 51% of the sexually active adults (between the ages of 18 and 49 years) in their study who were at any increased risk of HIV infection (defined as having two or more partners in the past year, having used intravenous drugs, having been diagnosed with a sexually transmitted disease or having anal sex without a condom in the last year), 84% considered their own personal risk to be “low” or “none at all.” Similarly, Stringer and colleagues (2004) reported that 52% of the 245 women in Lusaka, Zambia who reported that they were at “low” or “no risk” for HIV infection (before being informed of their actual serostatus) were actually already infected with the virus. An additional finding of this study was that women with higher levels of HIV/AIDS-related knowledge appeared more likely to engage in more risky behaviors (Stringer et al., 2004).
Perceived risk is frequently cited as a necessary component of behavioral change, and has been listed as a central construct in many major health behavior models (Kaemingk & Bootzin, 1990). Perceived risk maintains a position of central importance in each the health belief model, the common sense model of illness danger, the theory of reasoned action, the PRECEDE model, the Information, Motivation, and Behavioral Skills (IBM) model, and the AIDS Risk Reduction Model (ARRM) (Kowalewski, Henson, & Longshore, 1997). The general idea behind the inclusion of perceived risk with a position of importance in each of these well known models is that individuals who recognize that their behavior places them at increased risk of HIV infection are more likely to engage in less risky behaviors than those who do not. But as stated above, individuals tend to underestimate their own risk as the phenomenon of unrealistic optimism tends to skew their assessments of their own risk. What complicates matters further is the fact that risk perception is likely influenced by one’s social identity or group membership; values, attitudes, beliefs, and behaviors are all developed in relation to one’s reference group. Additionally, the moral stigma associated with HIV and AIDS and the tendency to deny risks associated with stigmatized behaviors may lead members of one high-risk group to underestimate their risks relative to those of another at-risk stigmatized group (Kowalewski et al., 1997).

Existing literature on health behavior research has seen perceived risk used as both an outcome variable as well as a predictor variable (Catania, Kegeles, & Coates, 1990). Kowalewski and colleagues (1997) reviewed relevant literature and reported that a variety of factors have been found to predict perceived risk of HIV infection. Among these factors are ethnicity, gender, partner characteristics, personal history of injection
drug use, having had multiple sex partners, social proximity to persons with AIDS, fear of AIDS, or health concerns (see Kowalewski et al., 1997). Conversely, findings regarding perceived risk as a predictor variable in the adoption of health behaviors has been mixed and inconclusive. Several studies found that heightened risk perceptions are significantly related to reductions in risky behaviors or intentions to engage in HIV preventative behaviors (e.g., Allard, 1989; Cochran & Peplau, 1991; Moatti, Bajos, Durbec, Menard, & Serrand, 1991). Cochran and Peplau (1991) and Schilling, El-Bassel, Gilbert, and Glassman (1993), for instance, both found indirect relationships between perceived risk and high-risk sexual behaviors. Still, other researchers found no relationship between perceived risk of HIV infection and the adoption of protective health behaviors or intentions to adopt these behaviors (e.g., James, Gillies, & Bignell, 1992; O’Leary, Goodhart, Jemmott, & Boccher-Latimore, 1992). These inconsistencies, however, do not indicate that perceived risk is an unimportant or irrelevant construct in regards to HIV/AIDS prevention efforts, rather they highlight the increased need for further exploration within different populations.
2. THE CURRENT STUDY

2.1 Rationale

An internal locus of control, a future orientation, increased power in relationships, and high perceived risk of HIV infection are all more likely to increase intended and actual condom use among women (Burns & Dillon, 2005; Kelly et al., 1990; Pulerwitz et al., 2000; Schilling, El-Bassel, Gilbert, and Glassman, 1993). However, in general, pregnant women are less likely than their non-pregnant peers to use condoms as the contraceptive motivation is lacking (i.e., the thought that “the damage is already done”) (Crosby et al., 2002). What they may not realize is that this increases their chances of STD or HIV infection during pregnancy. Pregnant women are often motivated by maternal feelings to improve their health for the sake of their developing child (Hobfoll et al., 1993); perhaps pregnancy itself and the maternal attachment that accompanies it may increase a woman’s perceived power in the relationship, future orientation, internal locus of control, and perceived risk now that she is acting on behalf of her unborn child as well as herself.

2.2 Hypotheses

2.2.1 Planned Hypotheses

Hypothesis 1: Pregnant women with higher levels of maternal fetal attachment (or positive attitudes towards the pregnancy and the baby) are more likely to have a future oriented temporal perspective than women with lower levels of maternal fetal attachment.

Rationale for Hypothesis 1: MFA is significantly associated with engagement in positive health promotion behaviors during pregnancy (Lindgren, 2001). Future time orientation
is linked to refraining from immediate pleasure in order to focus on long-term rewards. Among pregnant women, the health of the unborn child can be seen as a long-term investment, however the level of MFA may influence whether the mother-to-be experiences a more future or present time orientation during her pregnancy. This is especially important because little research (e.g., Burns & Dillon, 2005) has examined these variables in a low-income, minority group, and no studies have been done on the temporal orientation of pregnant women.

Hypothesis 2: Pregnant women with higher levels of maternal fetal attachment (or positive attitudes towards the pregnancy and the baby) are more likely to have an internal AIDS health related locus of control compared to women with lower levels of maternal fetal attachment who may be more likely to have an external LOC.

Rationale for Hypothesis 2: MFA is significantly associated with engagement in positive health promotion behaviors during pregnancy (Lindgren, 2001). Internal AIDS health locus of control is also more closely linked to positive HIV/AIDS preventative behaviors among gay men, but not among black undergraduate students (Kelly et al., 1990; Burns & Dillon, 2005). Earlier research found that “poor black women” (Fisch, 1974) were highly external; however this research was conducted on non-pregnant women. To date, no research has been conducted on how MFA influences health related locus of control in a sample of minority women living in poverty.
Hypothesis 3: It is expected that maternal-fetal attachment moderates the relationship between health related locus of control and engagement in positive prenatal health behaviors/risk reduction behaviors.

Rationale for Hypothesis 3: Following from the findings of Norman and colleagues (1998) who found evidence to suggest that the value one places on his or her own health moderates the relationship between health locus of control and engagement in health behaviors, it is expected that MFA will act in the same way as the value one places on his or her own health. As pregnant women may place a higher value on their own health in an attempt to secure the health of their unborn child, in the current study, the extent to which the pregnant woman values the pregnancy (i.e., attachment and attitude towards the pregnancy) will be a proxy for value on health.

Hypothesis 4: It is expected that maternal-fetal attachment moderates the relationship between temporal orientation (future vs. present) and engagement in positive prenatal health behaviors/risk reduction behaviors.

Rationale for Hypothesis 4: It is known that individuals with a future oriented time perspective are more likely to engage in positive health promotion behaviors and fewer risky behaviors, and that pregnant women with higher levels of MFA do the same. It is expected in this study that the level of MFA will influence the strength of the relationship between temporal orientation and health promotion/risk reduction behaviors such that women with higher levels of MFA and a future temporal orientation will be most likely to engage in positive prenatal health behaviors and HIV risk reduction behaviors, while...
women with subsequent combinations of high/low MFA and future/present temporal orientations will show decreasing probability to engage in such behaviors.

2.2.2 Exploratory Hypotheses

*Hypothesis 5:* Among pregnant women, higher levels of maternal-fetal attachment will be associated with a higher level of perceived relationship power.

Rationale for Hypothesis 5: MFA has been associated with many positive health practices during pregnancy. Other research has shown that women with higher levels of power within their romantic relationships are more likely to use condoms, which is also considered a positive health practice regardless of pregnancy status. Because MFA predicts positive health behaviors, as does level of relationship power, it is therefore hypothesized that the more attached a woman is to the unborn child, the more empowered she may feel in her relationship with her partner to insist on methods to protect the fetus.

*Hypothesis 6:* It is expected that level of maternal-fetal attachment will moderate the relationship between relationship power and condom use in a sample of pregnant women.

Rationale for Hypothesis 6: Research on perceived power in relationships suggests that women with higher levels of power in their romantic partnerships are more likely to have their partners agree to use male condoms and to actually follow through on intentions to use condoms. Similarly, pregnant women with higher levels of MFA are also more likely to engage in health promotion and risk reduction behaviors during pregnancy. It is hypothesized that MFA and relationship power will interact significantly in the prediction of condom use/risk reduction behaviors during pregnancy.
Hypothesis 7: Among pregnant women, higher levels of maternal fetal attachment are significantly associated with higher levels of HIV risk perception.

Rationale for Hypothesis 7: Literature on risk perception indicates that it has been explored as both a predictor variable as well as an outcome variable. In studies examining risk perception for HIV infection as a predictor variable, it has been shown that increased risk often leads to engagement in less risky behaviors (e.g., Schilling et al., 1993). It is hypothesized here that the MFA that develops during pregnancy may influence a woman’s perceived risk for HIV infection such that women with higher levels of MFA will show higher levels of risk perception.
3. METHODS AND PARTICIPANTS

3.1 Participant Recruitment

Pregnant participants for the current study were recruited from the waiting room of the Women’s Care Center located at 1427 Vine Street, Philadelphia, Pennsylvania. This clinic is an affiliate of the Drexel University College of Medicine and Hahnemann Hospital Tenet Health Care System. The director of the Women’s Care Center, Dr. Sandra Wolf, gave her permission for recruitment and assessment protocols for this study to take place at the clinic. The clinic’s patients consist mainly of low-income, Black women living in the city of Philadelphia. About one third of the women who present for care are pregnant with their first child, while the remaining two thirds of the women present with a subsequent pregnancy.

3.2 Inclusion Criteria

Pregnant women who were over age 18 years and fluent English speakers (at a 6th grade reading level), were included in the study. In order to have had time to confirm their pregnancy status and possibly been sexually active while knowing that they were pregnant, participants were required to be at least 20 weeks pregnant. Participants must have had penile-vaginal intercourse at least once since learning they were pregnant as well as have used a condom at least once during vaginal sexual intercourse with a male partner in the year prior to becoming pregnant. Participants were also required to be HIV-negative at last HIV test. HIV tests are routinely administered to pregnant women at their first prenatal visit so every pregnant woman was aware of her HIV status.
The inclusion criteria listed above specify that in order to be eligible for the study, women must have used condoms during penile-vaginal intercourse at least some of the times during the previous year in order to capture a sample of women who are amenable to using condoms at all.

Although previous research (Zimerman & Doan, 2005) has shown differences in attachment scores as measured on Condon’s Maternal Antenatal Attachment Scale (1993) such that first time mothers score higher on prenatal attachment than do mothers pregnant with a subsequent child, this study will not restrict enrollment to first time mothers. Authors Zimerman and Doan (2005) have suggested that perhaps pregnant women expecting a subsequent child are busy with their already existing children, which leaves them less time to think about the developing fetus. Alternatively they also posit that perhaps these results were found due to the fact that these women have already experienced pregnancy before, these mothers feel less preoccupied with the fetus and pregnancy as it is more routine. Regardless of the reasons why first time mothers report higher levels of attachment than mothers pregnant with subsequent pregnancies, these differences were accounted for by statistical control as opposed to research design control.

3.3 Exclusion Criteria

Pregnant women over the age of 35 were excluded from the current study as women of advanced maternal age may be at higher risk for complications during pregnancy and may therefore be otherwise motivated to preserve the health of the fetus for other reasons. Additionally, men were excluded from the study.
3.4 Recruitment and Assessment

All female patients attending the Women’s Care Center who were between 18-35 years old and at least 20 weeks pregnant were approached by study personnel following referral from medical clinic staff. The patients were approached by the study researcher or research assistant in the waiting room of the clinic, after they had undergone the initial triage and were waiting for a room assignment in order to be seen by the doctor or nurse practitioner.

The study research assistant asked the woman if she would be interested in answering a few questions while she waited for the doctor. If she agreed, the consent form and the screening questionnaire were then administered in a secluded area of the waiting room. If the woman was eligible to participate she was then invited to continue with a longer set of questions and self-report measures. An example of the script that was used is as follows:

“If you agree to participate, I’ll ask you a series of questions about various topics related to your pregnancy. I’ll be asking you about your behaviors, attitudes and beliefs regarding your pregnancy, your baby, and your sex life before and since you’ve become pregnant. I’ll also ask you to fill out some questionnaires. Does this sound okay to you? Would you be interested in participating while you wait for the doctor?”

3.5 Informed Consent

The purpose of the study was explained to the women as research which intends to investigate sexual and health related behaviors, attitudes, and relationship issues among sexually active pregnant women in order to better protect the health of women and
their children. The participants were told that there are no real benefits to participation in the study other than that they may learn something new about themselves. Risks were explained by acknowledging that that certain questions may cause mild distress. The participants were told that all identifying information would be kept confidential, no records with a name would ever be shown to a woman’s doctor or partner, and that after the study enrollment, all documents would be identified with a research ID number. Finally, each participant was informed that she would receive $5 in cash to thank her for her time in participating.

3.6 Training

Each research assistant associated with this project was trained to ensure that she was able deliver the assessment in a sensitive and competent way. Research Assistants were three female graduate students in the fields of psychology or post-baccalaureate pre-medicine. The training they received consisted of a sexual desensitization workshop where they learned to feel comfortable with the terminology they would be using during the protocol. There was also a sensitivity training regarding multicultural issues in light of the fact that the majority of the participants are expected to be low-income minority women. This ensured that the research assistants who collected the data behaved in a way that is consistent with the non-judgmental and sensitive attitudes that generally make it easier for the research participants to respond truthfully.

3.7 Ethical Considerations

It was determined that if, during the study, any participant became distressed by the subject matter, the proper referral to a mental health practitioner or hotline would be
made. A list of phone numbers of mental health practitioners in the area and Philadelphia mental health hotlines was provided to all participants at the start of the study. Additionally, Dr. Sandra Wolf, the primary care obstetrician and the Women’s Care Center’s staff social worker were to be informed by the study personnel of any adverse reactions the participants may have to the study protocol. There was only one such case where a referral was warranted and the appropriate steps were taken to ensure that this woman was seen in a timely manner by the social worker on duty at the time.

3.8 Measures

*Maternal Antenatal Attachment Scale (MAAS; Condon, 1993)*

The MAAS was developed and validated by Condon, an Australian researcher who critiqued the existing instruments by noting that they inadequately differentiated the attitude towards the baby from the attitude towards the pregnancy and impending role of motherhood. Condon’s measure focuses on the thoughts and feelings about the baby and ignores attitudes about the physical state of pregnancy or the maternal role. The measure consists of two factors, quality and intensity. Quality describes the affective experiences the mothers reported including closeness/distance, tenderness/irritation, positive/negative, joyful/unpleasant anticipation, and a vivid/vague internalized representation of the fetus as a real person. Intensity refers to the amount of time the mother spends thinking about, talking to, dreaming about, or tactiley interacting with the fetus. This instrument contains 19 items and a high internal consistency with alpha equal to .82.

*MATERNAL ATTITUDES AND MATERNAL ATTACHMENT (MAMA; Kumar, Robson, & Smith, 1984)*

The MAMA questionnaire was developed and validated by Kumar, Robson, and Smith in 1984. The questionnaire consists of five subscales measuring body-image,
somatic symptoms, marital relationship, attitudes towards sex, and attitudes to pregnancy and the baby. For the purposes of the current study, only the subscale measuring attitudes to pregnancy and the baby will be used. This subscale includes 12 items rated on a 4-point Likert type scale ranging from “never” to “very often.” The questionnaire was tested on a group of 218 pregnant women who either volunteered to help validate the measure (n=99) or were already taking part in a prospective study of mental health (n=119). Responses were recorded at the 12th week of pregnancy. Test-retest reliability (n=38) revealed an alpha of .81, while split-half reliability (n=119) showed an alpha of .74. The Attitude Toward Pregnancy and the Baby subscale was significantly correlated with responses on both the Neonatal Perception Inventory and a systematic interview administered by the researchers that had previously been shown to have satisfactory inter-rater reliability (kappa = .90). The 60-item questionnaire was completed by the majority of participants without difficulty in about 10 minutes. Because only one subscale (12 questions) of the questionnaire will be used, it is anticipated that the measure will take as little as 2-3 minutes to complete.

Of the measures describing MFA, the MFAS and the MAAS are the two most commonly used measures (Laxton-Kane & Slade, 2002).

*Health Practices in Pregnancy Questionnaire-II (34-item) (HPQ-II; Lindgren, 2005)*

The original HPQ (Lindgren, 2001) is an 18-item self-report questionnaire designed to assess health practices during pregnancy that have been shown to be related to pregnancy outcomes: diet, substance abuse, adequacy of prenatal care, rest and exercise, use of seatbelts, and education about childbearing. Despite good internal reliability and validity, the author felt there were shortcomings and revised the
Questionnaire to improve some awkward items and some items that may not be clear to minority populations, resulting in the HPQ-II. The HPQ-II is a 34-item scale that addresses adequacy of health practices in the following areas: balance of rest and exercise, safety measures, nutrition, avoiding use of harmful substances, obtaining health care, and obtaining information. Each item is rated on a 5-point Likert scale ranging from 1 (never) to 5 (always, daily, or frequently). Higher scores indicate a higher quality of health practices important to pregnancy outcomes. The potential scale range is 34-170 and the measure takes approximately 10 minutes to complete. The HPQ-II has an alpha coefficient of .81 and was significantly correlated with both The Health Promoting Lifestyle Profile (r = .54) and the Attitudes Toward Pregnancy and the Baby subscale of the MAMA (r = .30).

*Sexual Relationship Power Scale (Pulerwitz et al., 2000)*

The Sexual Relationship Power Scale was developed by Pulerwitz and colleagues (2000) to assess power in intimate relationships. The SRPS is a 23-item scale that is comprised of two subscales measuring issues related to Relationship Control and Decision-Making Dominance within the relationship. The subscales are sufficiently reliable to use independently or in conjunction with one another. The internal consistency reliability of the overall scale is .84. The Relationship Control subscale consists of 15 items and has a reliability coefficient of .86, while the Decision Making Dominance subscale includes 7 items and a reliability coefficient of .62. The measure was validated on a population of African American and Latina women, which makes it useful for the current study which aims to capture a sample of similar women. The SRPS contains four items which are related to condom use (e.g., “If I asked my partner to use a
condom he would get angry”). These items were removed and the Scale reanalyzed in order to ensure that the SRPS’s association with consistent condom use was not solely related to these four items. The modified version of the scale (SRPS-M) still showed a significant relationship with the outcome of consistent condom use. The SPRS-M also shows good internal reliability (alpha = .85) as does each of the subscales (alpha, Relationship Control = .84; alpha, Decision Making Dominance = .60).

**Perceived Risk Scale (Lollis et al., 2000)**

The Perceived Risk Scale consists of five face valid questions designed to assess worry or concern about AIDS and feelings regarding one’s likelihood of contracting the virus. Three items on the scale were adapted from a scale used by Adame and colleagues (1991) which measured students’ perceived susceptibility, knowledge, and attitudes regarding AIDS. Lollis and colleagues (2000) also retained two additional items that had been added to the scale by Johnson and colleagues (1992). Items are presented on a five point Likert scale from Strongly Disagree (1) to Strongly Agree (5) and a composite score is obtained by adding the numbers each participant endorses. Higher scores on this measure indicate increased perceptions of AIDS vulnerability. The alpha coefficient for this scale is good at .73.

**AIDS Multidimensional Health Locus of Control Scale (AIDS MHLOC; Kelly et al., 1990)**

The AIDS MHLOC Scale is used to assess AIDS related health locus of control and is an adaptation by Kelly and colleagues (1990) of the original Health Locus of Control (HLOC) Scale (Wallston, Wallston, & DeVellis, 1978). Kelly and colleagues (1990) modified nine items to make the scale pertinent to HIV/AIDS. These items
reflected the original measures’ three dimensions: Internal Control, Chance/Luck External Control, and Powerful-Others External Control. All items are arranged on a six point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). While Kelly and colleagues (1990) did not report on psychometric properties of the revised items within the scale, Glaser (1995) did. Glaser (1995) reported an internal consistency of alpha = .77 and a test-retest reliability at two weeks apart of .86. This author also reported on the reliability for the individual subscales; alpha = .75, .57, and .55 on the Internal Control, Chance/Luck External Control, and Powerful-Others External Control subscales respectively. Due to the low reliability among the External subscales of the AIDS MHLOC Scale, these items were reserve scored and summed with the internal items to create a total score. Higher scores reflect higher levels of an internal locus of control. The reliability for this summated scale was determined to be fair (alpha = .69) (Burns & Dillon, 2005; Glaser, 1995).

Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999; also referred to as the Stanford Time Perspective Inventory) (37 items)

Zimbardo and Boyd (1999) developed and validated the Zimbardo Time Perspective Inventory thus improving the theoretical basis of time perspective/temporal orientation by reconceptualizing the construct as an overarching, non-conscious psychological process which includes social, personality, affective, and cognitive influences which shape a person’s perceptions, actions, and goals. There are three subscales which each use a 5-point Likert response scale ranging from “very uncharacteristic” to “very characteristic.” The future scale includes 13 items, the hedonistic scale, 15 items, and the fatalistic scale, 9 items. Reliability for the scales is
good with average inter-item correlation for the future, hedonistic, and fatalistic scales reported at .24, .22, and .25 respectively. The average corrected item total correlations were reported at .44, .41, and .42 for the future, hedonistic, and fatalistic scales, respectively. And, lastly the alpha reliability coefficient was .81, .80, and .74 respectively for the three scales. For the purposes of this study, only the future and the hedonistic scales will be given. Personal communication with the first author has confirmed that this is an acceptable use of the instrument (P.G. Zimbardo, personal communication, July 31, 2008).

3.9 Statistical Power Analyses

Based on the program g-power in combination with Cohen’s power tables (1992), it was determined that in order to see a power of .80 with a medium effect size (.30) and alpha equal to .05, 84 participants will be necessary to detect an effect if it really exists for those hypotheses (1, 2, 5, & 7) that will utilize a linear regression analysis. Sixty-eight participants are necessary for those hypotheses (3, 4, & 6) which will utilize a multivariate regression moderator analysis, assuming that the minimum accepted power of .80 will be used along with a medium effect size (.15) and alpha equal to .05.
4. RESULTS

All data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 16. Initial descriptive analyses were conducted to provide sociodemographic information about the women who participated in the study, as well as more detailed information about other variables of interest.

4.1 Participant Sociodemographics

Over the course of one year (January-December 2009), a total of 269 women were approached in the waiting room of an urban prenatal clinic after having been identified by clinic staff as eligible according to maternal and gestational age. Of this number, a total of 101 women enrolled in the study. A total of 168 women did not participate; 39 were interested but self-reported they were ineligible once the study criteria were explained, and 129 declined to participate. No demographic data were collected from the women who did not participate as the Drexel University Institutional Review Board did not grant approval for this. Of the 39 women who were interested but did not enroll, 35.8% (n=14) self-reported that they were not eligible due to their age (less than 18 or over 35), 23% (n=9) self-reported that they were not eligible due to being less than 20 weeks gestation, 15.4% (n=6) self-reported that they were not eligible due to lack of condom use, 12.8% (n=5) women were ineligible due to lack of English language fluency, 10.25% (n=4) self-reported that they were not eligible due to lack of sexual activity during pregnancy, and 5.1% (n=2) declined to answer why they were ineligible. Of the 129 women who declined to participate, 58.1% (n=75) stated they were not interested while the remaining 41.9% (n=54) women stated that they did not have time. Roughly 50% of the women who reported that they did not have time reported that this was the case because they
were scheduled to have an ultrasound directly following the scheduled prenatal appointment.

One hundred and one eligible pregnant women were enrolled in the study. Of these, 100 women completed the study by answering all of the interview questionnaires. The one woman who did not complete the study was unable to do so as clinic staff recommended she go directly to the labor and delivery unit shortly after beginning the interview. Data from this participant were excluded from the analyses. As expected, non-Hispanic Black women comprised the majority of the sample, representing 81% (n=81) of the participants. Non-Hispanic white women made up 5% of the sample, Hispanic Black, Hispanic ‘other’, and non-Hispanic biracial women each comprised 4%, and Hispanic biracial women represented 2%. The mean age of the participants was 23.56 years old with a standard deviation of 5.098 and a range of 18-35.

Of the 100 participants in the study, 48% reported themselves as never married, 43% reported themselves as single and living with their partner, and 9% were married. On average, the women presented for enrollment in the study at 30.46 weeks gestation with a standard deviation of 6.3 weeks, and a range from 20-40 weeks. For 41% of the women, the current pregnancy would result in their first living child; 33% percent of women already had one child, 14% had two, and 12% had three or more children. Twenty-nine women reported that the current pregnancy was their first. Of the 71 women who reported having had a prior pregnancy, 49.3% (n=35) reported having had at least one elective abortion and 31% (n=22) reported having had at least one spontaneous pregnancy loss.
Eighty-two women (82%) reported that the current pregnancy was unplanned. Only 18 women (18%) reported having planned to become pregnant with the current pregnancy. Of the 82 women who did not plan their pregnancies, 17.1% (n=14) reported not having wanted the current pregnancy or any future pregnancies in their lifetime. Of the remaining 68 women who had desired a future pregnancy at some point in their lifetime 70.5% (n=48) reported that the pregnancy had occurred too soon, 17.6% (n=12) reported that it had occurred at the right time, 2.9% (n=2) reported the pregnancy had occurred too late, and 8.82% (n=6) did not have a preference regarding the timing of the pregnancy. See Table 2.

Sexual activity was examined to determine whether this sample reported numbers consistent with other published research on number of sexual partners and condom use in a low-income, primarily African American population (i.e., Cochran & Peplau, 1991; Rothspan & Read, 1996). These, as well as other studies have shown that, in general, minority women living in low-income communities tend to initiate sexual experience earlier, have more lifetime sexual partners, and use condoms or other safer sex practices less often. In the current sample, 16% of the women had had more than 1 sexual partner in the six months prior to confirming their pregnancy; actual numbers of sexual partners ranged from two to eight sexual partners in the previous six month period. Only 3% of the participants reported more than 1 sexual partner during pregnancy, and each of these three women had had two sexual partners during their pregnancies. Means for number of sexual partners in the six months prior to pregnancy and during pregnancy were 1.25 and 1.03 with standard deviations of .821 and .171, respectively. A paired-samples t-test
revealed that there was a significant decrease in number of sexual partners after pregnancy was confirmed ($t(99)=2.712, p=.008$).

Amount of sexual activity and rate of condom use was also explored. Overall, the sample was highly sexually active both prior to and during pregnancy. The mean number of sex occasions in the six months prior to confirming the pregnancy was 119.03 with a standard deviation of 67.87 and a range from 2-504. The number of sex occasions during pregnancy was significantly lower ($t(99)=2.350, p=.021$) with a mean of 47.16, a standard deviation of 64.6 and a range from 1-400. Condom use also significantly decreased from the six months prior to becoming pregnant to the prenatal period ($t(99)=-3.171, p=.002$). Condom use prior to pregnancy was at a mean rate of 24.6% of all sexual contact (sd=29.3), while condom use during pregnancy declined to 13.3% of all sexual contact (sd=29.47). Interestingly, prior to pregnancy, only 31% (n=31) of the participants reported ‘never’ using condoms; after pregnancy was confirmed that number jumped to 74% of the women.

### 4.2 Main Variables

The mean score for the current sample on maternal fetal attachment (MFA) as measured by the Maternal Antenatal Attachment Scale (MAAS) is 81.95 with a standard deviation of 8.12 and a range of 62-95. Skewness is determined to be -.799 with a standard error of .241 indicating a significantly negatively skewed distribution of scores on this measure. A negatively skewed distribution indicates that there are more high scores on this measure than might be seen in a normally distributed sample, suggesting that the women who participated in this study generally have high levels of MFA.
The mean score on the AIDS Multidimensional Health Locus of Control Scale (AMHLOCS), which measures internal versus external locus of control (LOC), is 26.54 with a standard deviation of 4.07 and a range of 17-39. Higher scores on this measure indicate a more internal LOC for AIDS/HIV acquisition. A skewness statistic of .411 with a standard error of .241 shows that this sample’s responses to this questionnaire are normally distributed.

Future and present temporal orientation measured by the Zimbardo Time Perspective Inventory (ZTPI) provided mean scores of 3.7 and 3.11, with ranges of 2.3-4.9 and 2.07-4.33 respectively. Compared to the mean provided by this measure’s author, the current sample scored relatively higher on future orientation and lower on present orientation than the normed sample. Skewness statistics for scores on the future subscale (skewness = -.019) and present/hedonistic subscale (skewness = -.074) show that each of these variables is normally distributed (SE of skewness = .241).

Lindgren’s (2005) Health Practices Questionnaire-II (HPQ-II) revealed a mean of 138.9 for the current sample, with a standard deviation of 12.7 and a range of 93-167. A skewness of -.666 with a standard error of .241 indicates that this sample reported a negatively skewed distribution of health practices during pregnancy. This indicates, similar to the findings for the distribution of MFA, that this sample generally reported high levels of engagement in healthy prenatal behaviors.

4.3 Planned Hypotheses

Hypotheses 1 predicted that pregnant women with higher levels of MFA are more likely to have a future oriented temporal orientation as opposed to women with lower
levels of MFA, who are likely to have a more present oriented temporal focus. Personal communication with the first author of the Zimbardo Time Perspective Inventory (ZTPI) indicated that the preferred method of data collection for this measure was to give at least two subscales. At Zimbardo’s suggestion, both the future and present/hedonistic subscales were used (P.G. Zimbardo, personal communication, July 31, 2008). In order to confirm that each of these subscales measured what it proposed to measure, correlation analyses were undertaken with data from the future and present/hedonistic subscales of the ZTPI. These two subscales were found to be significantly negatively correlated ($r(98) = -.227, p<.05$) indicating that they measure opposite constructs (i.e., those who have a high future orientation also have a low present/hedonistic orientation). Based on this information, and with confirmation that this was an appropriate use of the data by the measure's author, only data from the future subscale were used (P.G. Zimbardo, personal communication, February 8, 2010).

In order to test the hypothesis that MFA is significantly associate with higher future temporal orientation, variables representing total scores from the maternal antenatal attachment scale (MAAS) and the ZPTI future subscale were entered into a bivariate linear regression in SPSS as the independent and dependent variables respectively. Results indicate that hypothesis 1 was confirmed; MFA is associated with a more future oriented time perspective in the mother-to-be ($R^2=.163, F(1,98)=20.229, p<.01; \beta=.414, t(98)=4.498, p<.01$) and explains a significant amount of the variance in ZPTI future scores.

Hypothesis 2 posited that pregnant women with higher levels of MFA are more likely to have an internal AIDS health multidimensional LOC compared with women
with lower levels of MFA who may be more likely to have an external LOC. This hypothesis was examined using a bivariate linear regression that aimed to fit these two variables into a best fit line. Variables representing total scores from the MAAS and the AMHLOC were entered into the data analysis program as the dependent and independent variables respectively. The regression, which confirms hypothesis 2, indicated that as MFA increases so does the score on the AMHLOC \( R^2 = .057, F(1, 98) = 6.9, p = .010; \beta = -.258, t(98) = -2.646, p = .010 \). MFA also explains a significant portion of the variance in LOC scores. As stated above, higher scores on the AMHLOC indicate a more internal LOC.

Hypothesis 3 examines the moderating effect of MFA on the relationship between health related LOC and engagement in positive prenatal health behaviors/risk reduction behaviors. Parity was controlled for as a covariate as correlation analyses revealed a significant relationships between parity and the dependent variable \( r(98) = -.273, p < .01 \). In order to appropriately analyze the data to show a moderating effect of MFA, a series of multiple regressions were used to first analyze main effects and then the interaction effects. Both MFA and health related LOC were entered as independent variables and run in separate bivariate regressions against the dependent variable, prenatal health behaviors. An interaction variable was created by multiplying the centered data from each of the two independent variables entered into a regression against the dependent variable, prenatal health behaviors. Data were centered in order to increase the ease of interpretation and to avoid problems with multicollinearity (Aiken & West, 1991; Judd & McClelland, 1993). As expected, there was a significant main effect of the relationship between MFA and positive prenatal health behaviors \( R^2 = .369, F(1, 98) = 20.324, p < .01 \);
β=.603, \( t(98)= 7.068, p<.01 \) indicating that as MFA increases so does engagement in positive prenatal health behaviors. There was no significant main effect of the relationship between AIDS related LOC and positive prenatal behaviors \( (R^2=.187, F(1,98)=3.272, p=.074; \beta=-.180, t(98)=-1.809, p=.074) \) although the p-value appeared to be approaching significance. According to Baron and Kenny (1986), it is still possible to find a significant effect of the interaction variable even if main effects are not significant. The analysis of the interaction variable confirmed hypothesis 3; there exists a significant moderating effect of MFA on the relationship between health related LOC and engagement in positive prenatal health behaviors as seen in Figure 1 \( (R^2=.043, F(3,96)=5.421, p<.05; \beta=.229, t=2.32, p=.02) \). This indicates that higher levels of MFA combined with a more internal LOC contributes to higher levels of engagement in positive prenatal health behaviors, while subsequent combinations of lower levels of each of these variables are associated with lower adherence to positive health behaviors during the prenatal period. Despite the fact that the moderating effect of MFA is significant, it should be interpreted carefully as the effect size \( (f^2 = .045) \) indicates that the interaction only accounts for a small amount of the variance in the relationship. Conversely, the effect size of the main effect of MFA \( (f^2 = .585) \) suggests that this is the driving variable in the regression. The effect size of the interaction as a whole only accounts for 4.5% of the variance while MFA alone accounts for 58.5% of the variance of the regression.

Because the relationship between health related LOC and prenatal health behaviors was significantly moderated by MFA, an analysis of the simple slopes was undertaken as a post-hoc probe to determine whether each of the variables was significant at a conditional value of the moderator (Holmbeck, 2002). To conduct an analysis of
simple slopes, both high and low values of the moderator were calculated at ± 1 standard
development (±8.08642) of the mean of the moderator. Then these new conditional
moderator values were used to create interaction terms by multiplying each of them by
the independent variable, health-related LOC. Two independent regressions were then run; the + 1 standard deviation value of the moderator was entered into a regression in
SPSS along with the independent variable, health-related LOC as well as the new
interaction term and run against the dependent variable, engagement in positive prenatal
health behaviors. The same procedure was undertaken with the –1 standard deviation
value of the moderator. This resulted in a simple slope (b=.077, p=.835) for those with
high MFA and a simple slope (b=-.19, p=.558) for those with low MFA. Although the
simple slope analyses were non-significant, this does not change the outcome of the
original interaction. These non-significant simple slopes indicate that neither simple
slope accounts for a significant amount of the variance of the equation alone, however,
the difference between them is still significant as indicated by the significant overall
interaction effect. This appears to confirm the fact that this regression has a relatively
small effect size.

Because this study initially proposed to examine HIV risk reduction behaviors in
addition to health promotion behaviors, hypothesis 3 was rerun (referred to herein as
hypothesis 3a) using rate of condom use during pregnancy as the dependent variable in
order to compare relative differences in the effect of the independent variables of interest
on HIV risk reduction. The covariate, parity, was not used in these analyses as
correlations revealed no significant relationship to the dependent variable. The variables
MFA, LOC, and the interaction variable MFA*LOC were entered into the regression
analysis against the dependent variable, rate of condom use during pregnancy, using SPSS. Contrary to expectations, there were no significant main or interaction effects.

Neither MFA, nor AIDS related health LOC were associated with condom use during pregnancy ($R^2=-.030$, $F(3,96)=.044$, $p=.988$; (LOC)$\beta=-.032$, $t(97)=-.303$, $p=.763$; (MFA)$\beta=.013$, $t(97)=.120$, $p=.905$). Although there were no significant main effects of the predictor variables, according to Baron and Kenny (1986) it is still an acceptable use of the data to test the interaction effect. This analysis, however, also yielded non-significant results indicating that there is no moderating effect of MFA on the relationship between AIDS related health LOC and condom use during pregnancy ($R^2=-.030$, $F(3,96)=.044$; $\beta=-.002$, $t(97)=-.020$, $p=.984$). Hypothesis 3a was not confirmed.

Hypothesis 4 predicted a moderating effect of MFA on the relationship between temporal orientation and engagement in healthy prenatal behaviors and HIV risk reduction behaviors. Similarly to Hypothesis 3, parity was used as a covariate due to the significant correlation with the dependent variable, and a series of multiple regression analyses were used to examine the main and interaction effects. Data for the two independent variables were centered and used to create an interaction term by multiplying the two data sets and creating a new variable. All three variables (X1, X2, and X1*2) were then entered into the regression in SPSS. As above, there was a significant main effect of the relationship between MFA and positive prenatal health behaviors ($R^2=.378$ $F(1,98)=61.084$, $p<.01$; $\beta=.620$, $t(98)=7.816$, $p<.01$). Results revealed a significant main effect of future orientation on healthy prenatal behaviors ($R^2=.095$, $F(1,98)=11.33$, $p<.01$; $t(98)=3.367$, $\beta=.322$, $p<.01$) indicating that as future orientation increases (and present orientation/hedonism decreases) so too does engagement in healthy prenatal
behaviors increase. Lastly, the interaction variable was entered into the regression and results revealed no significant moderating effect of MFA on the relationship between temporal orientation and engagement in prenatal health behaviors ($R^2 = .001$, $F(3, 96) = 1.121$, $p = .292$; $\beta = -.106$, $t(98) = -1.059$, $p = .292$). Consultation with the measure's author and his colleague revealed that using a median split to differentiate “caseness” of future orientation (i.e., having a score below the median on the future orientation subscale indicates a present orientation) is sometimes recommended (N. Fieulaine, personal communication, February 8, 2010). When data for the future subscale of the ZTPI were transformed into categorical data using a median split (future vs. present), results showed that there was a significant moderating effect of MFA on the relationship between time perspective and prenatal health behaviors (see Figure 2) ($R^2 = .242$, $F(3, 96) = 32.653$, $p < .01$; $\beta = .500$, $t(98) = 5.714$, $p < .01$). With the median split data, there continued to be a significant main effect of future vs. present orientation on prenatal health behaviors ($R^2 = .048$, $F(1, 98) = 6.045$, $p = .016$; $\beta = .241$, $t(98) = 2.459$, $p = .016$). An effect size of $f^2 = .607$ suggests that MFA accounts for more of the variance in the regression than the interaction ($f^2 = .319$) and so although the interaction is statistically significant, it should be interpreted with caution.

Because the moderating effect of MFA was significant as above in Hypothesis 3, the same procedure to run an analysis of the simple slopes was undertaken. High and low values of the moderator were calculated using $\pm 1$ standard deviation of the value of the moderator. These new conditional moderator values were used to create two new interaction terms with the independent variable, temporal orientation. Then regressions were run in SPSS for each conditional value of the moderator (high and low). This
resulted in simple slopes of \( b=2.7, p=.484 \) for those with high MFA and \( b=-.035, p=.990 \) for those with low MFA. As above, the non-significant simple slopes analyses suggest that neither simple slope accounts for a significant portion of the regression on its own. The overall interaction described above indicates however that these simple slopes are significantly different from each other even if they are not significantly different from zero.

For hypothesis 4a, the same procedure was undertaken to rerun the data against the dependent variable of condom use; the variables representing MFA, temporal orientation and their interaction variable were regressed on the dependent variable, condom use during pregnancy. Similar to hypothesis 3a, results of this analysis were not significant, showing no significant effect of either independent variable or their interaction on rates of condom use during pregnancy \( (R^2=-.017, F(3,96)=.445; (MFA)\beta=-.037, t(97)=-.325, p=.746; (ZTPIfuture) \beta=.081, t(97)=.728, p=.468; (MFA*ZTPIfuture) \beta=-.090, t(97)=-.848, p=.399) \). Hypothesis 4a was not confirmed.

4.4 Exploratory Variables

Sexual relationship power was measured by the Sexual Relationship Power Scale which yielded a mean score of 49.8 with a standard deviation of 7.07 and a range of 34-60. The skewness statistic is equal to -.162 with a standard error of skewness of .241. The current sample’s scores on this measure are there normally distributed as the skewness statistic is less than two times the standard error of skewness.

Perceived HIV risk, which was measured by the Perceived Risk Scale, resulted in a mean score of 17.23 with a standard deviation of 3.472 and a range of 10-27. The
sample is normally distributed as skewness equals .105 with a standard error of skewness of .241.

### 4.5 Exploratory Hypotheses

Hypothesis 5 predicted a linear relationship between MFA, as measured by the MAAS, and relationship power, as measured by the Sexual Relationship Power Scale (SRPS). This hypothesis assumed that higher levels of MFA would influence a woman to act on behalf of her unborn child’s health and increase her perceived power in the relationship with her sexual partner. This hypothesis was analyzed using a bivariate linear regression. Results were significant, suggesting that higher levels of MFA are significantly associated with a higher level of perceived power in the sexual/romantic relationship ($R^2=.086, F(1,98)=10.288; \beta=.268, t(99)=3.207, p=.002$).

Hypothesis 6 predicted a moderating effect of MFA on the linear relationship between perceived power in the relationship and condom use during pregnancy. As above, for analyses on hypotheses 3 and 4, each of the independent variables were centered and then an interaction variable was created by multiplying the centered data. All three variables were then entered into a series of multiple regression analyses in SPSS. Results yielded non-significant findings for each of the two main effects as well as the moderator effect ($R^2=-.007, F(3,96)=.770; (MFA)\beta=-.017, t(99)=-.148, p=.883; (SRP)\beta=-.056, t(99)=-.529, p=.598; (MFA*SRP) \beta=-.152, t(99)=-1.405, p=.163$).

Hypothesis 7 predicted a linear relationship between MFA and HIV risk perception such that higher levels of MFA are associated with higher levels of HIV risk perception. The hypothesized relationship was examined with a bivariate linear regression and determined to be non-significant suggesting that among the 100
participants in this study, MFA is not significantly associated with an increased HIV risk perception ($R^2=-.005$, $F(1,98)=.548; \beta=.075; t(99)=.740, p=.461$).
5. DISCUSSION

5.1 Sociodemographics

A sample of women generally determined to be at high risk for HIV acquisition was targeted for this study by recruiting participants from the waiting room of an urban Philadelphia prenatal clinic which serves predominantly young, low-income, minority women carrying unplanned pregnancies. Collectively, they are representative of the young, low-income, minority women who currently comprise the fastest growing group of individuals being diagnosed with new cases of HIV in the United States. Despite the high prevalence of unplanned and even unwanted pregnancies in this sample, these women scored higher than the normed samples on measures examining their levels of maternal fetal attachment. While this could be due to a social desirability effect as the questionnaire was administered in an interview format, it has been noted in other literature that once the initial shock of an unexpected pregnancy wears off, future mothers are generally satisfied with their pregnant status (Levine Kornfield & Geller, unpublished manuscript). Similarly, participants tended to have scores on the ZTPI future scale indicating higher levels of future orientation than what was evident in the normed sample, which contradicts the expectations set up by Padawer and colleagues (2007). According to Padawer et al., those who are more likely to be oriented to their own futures are male, more highly educated, older, and earning higher incomes. The characteristics of the participants enrolled in this study are largely opposite of those posited by Padawer and colleagues to have higher levels of a future orientation in that they are female, less educated, young, and earning low, if any, incomes. It would have been interesting in the current study to have had a comparison group of non-pregnant women in order to
determine whether future temporal perspective was a direct outcome of pregnancy as mothers-to-be focus on a specific future date as they await the birth of their child.

5.2 Planned Hypotheses

Hypothesis 1, which was confirmed, found that MFA is significantly associated with future temporal orientation indicating that pregnant mothers with stronger attachment to the developing fetus are more likely to be cognizant of how their current actions and goals affect later outcomes. Because previous research (i.e., Padawer et al., 2007) found that those with future perspectives tend to be older, male, more highly educated, and earning higher incomes the findings detailed herein are a departure from the published literature in that the participants in this study differ markedly from those who generally are more future oriented. Once pregnancy is confirmed and the mother’s attachment to her unborn child grows, it seems as though the mother begins to develop a heightened awareness that her actions may affect outcomes that will only be seen later in the life of her child. It is a general assumption that most pregnant women are motivated to ensure the wellbeing of the fetus. The finding of hypothesis 1 confirms this supposition by noting that pregnant women with more attachment to the fetus are more willing to put immediate desires and pleasures aside as they plan for the future of their child. Sadly, the alternate of this is also true; pregnant women with less attachment to the fetus are less likely to put aside immediate gratification for the investment in future outcomes.

Similar to hypothesis 1, hypothesis 2 found that MFA is significantly associated with an internal AIDS-related LOC. This finding suggests that as the mother’s attachment to the fetus increases she feels more strongly that her own actions can control
her health related outcomes. Because MFA is a construct that is solely relevant during
the unique prenatal period in a woman’s life, it is possible that as the reality of the
pregnancy becomes apparent, a woman begins to understand the connections between her
own behaviors and their consequences (i.e., that her unprotected sexual activity prior to
pregnancy resulted in becoming pregnant) and this leads to a greater understanding that
her own actions can lead to different outcomes. As attachment to the fetus grows, so too
does the belief that the pregnant woman’s own behaviors will have an effect on her
ability to remain free of HIV/AIDS, also known as an internal locus of control.

These results add to the findings published by Fisch (1974) which found that
“poor black women” were highly external, meaning that they did not believe that their
own actions necessarily contributed to their health outcomes. The current study, largely
comprised of a sample similar to Fisch’s, however, finds that pregnancy and the resultant
attachment that develops in the mother for her unborn child may influence a woman to
realize that her own actions can have an impact on what happens to her health. This shift
from external to internal LOC may be due to the fact that the pregnant women in this
study were receiving regular prenatal care and may have been influenced towards this
mode of thinking by their prenatal care medical providers. Evidence against this is that
women with lower levels of MFA also tended to show a more external bias in HIV/AIDS
related LOC suggesting that it was not solely the intervention of the medical provider, but
rather some quality unique to pregnancy or MFA that results in a general change from
external to internal LOC. In other words, if a medical provider was able to influence
pregnant women to have a more internal locus of control then this might be evident
among all women regardless of their level of attachment to the fetus. Because the level
of internal LOC varies by level of MFA, it appears likely that level of attachment, which is a unique quality of pregnancy, is more responsible for the change in cognitive style than an educational intervention by the prenatal care provider.

As predicted, hypothesis 3 found a moderating effect of MFA on the relationship between LOC and healthy prenatal behaviors. In examining the main effects of this hypothesis, the current study confirms Lindgren's (2001) findings that MFA significantly predicts adherence to positive prenatal health behaviors as measured by her Health Practices in Pregnancy Questionnaire-II. Just as Norman and colleagues (1998) found evidence to suggest that the value one places on one's health moderates the relationship between LOC and living a healthy lifestyle, the current study finds that among pregnant women, the level of attachment to the fetus acts as a proxy for the value one places on one's own health. Interestingly, with no main effect of LOC on healthy prenatal behaviors, it can be concluded that an internal LOC alone does not necessarily prompt an individual into action for health related behavior change. However, when combined with the attachment towards the developing child, those with an internal LOC are most likely to engage in more frequent adherence to healthy behaviors during the prenatal period. This finding could be due to the fact that many individuals are not motivated to maintain their own health even though they know what to do and how to do it. This is common among medical patients diagnosed with diabetes (i.e., Glasgow, Toobert, & Gillette, 2001) as well as other chronic conditions including HIV/AIDS (i.e., Kalichman et al., 2001). It is often easy to justify not taking proper care of oneself as there is a perception that it is the individual alone who will suffer as a result. In the case of pregnancy, an expectant mother no longer has the "luxury" of neglecting her own health and assuming
that she alone will bear the consequences. Simply because a woman has the knowledge that her own actions can control her health outcomes (i.e., internal LOC) does not mean that she will take part in proper self-care. However, understanding and caring that her actions may adversely affect her future child may initiate the motivation needed to engage in positive prenatal health behaviors.

The results of this moderator analysis also shed light on an unexpected finding. Among women with a low MFA, a high internal LOC is less likely to be associated with engagement in prenatal health care behaviors than a low internal (i.e., external) LOC. Because the HPQ-II was not designed to measure constructs other than overall prenatal health behaviors, it was not possible to look at different types of prenatal health behaviors in order to draw conclusions about whether women with a high vs. low MFA may be more likely to engage in certain types of prenatal care behaviors. Had a measure been chosen that differentiated between self-oriented and fetus-oriented prenatal health behaviors it may have been possible to do some additional statistical analyses to investigate this curious finding. It is possible that among women with a low level of MFA those who have a low internal (i.e., external) LOC engage in more health behaviors because they may be more compliant with instructions from a medical provider. Women with an external LOC are more inclined to believe that their health outcomes are related to chance or fate. Because the medical provider is a force separate from the woman herself, pregnant women with external LOC may be more inclined to comply with his or her directions even without the understanding or belief that her own actions will have a positive impact on the fetus if adhered to correctly. Alternatively it is possible that women with a low MFA and a high internal LOC may be those who are depressed or
distressed over their pregnancy status because they recognize the extent to which their own actions are responsible for their present situation. In these cases, the neglect of prenatal health care behaviors could reflect the low level of attachment that has developed between the mother and child. The above information is solely speculation.

What can be definitively said is that it appears that MFA is the driving variable in the interaction and that the low level of MFA is likely more responsible for low levels of engagement in prenatal care behaviors than the internal locus of control among women with those combination of traits.

Hypothesis 4 found a significant moderating effect of MFA on the relationship between a pregnant woman's time perspective and her tendency to engage in positive prenatal health behaviors. As above, the main effect of MFA on health behaviors confirmed the findings of Lindgren (2001). A significant main effect of future time perspective on positive prenatal health behaviors among the pregnant women in this study also seems to logically follow the findings of previous researchers whose work indicated that those with a future orientation are more likely to drive safely (Zimbardo et al., 1997), use condoms more frequently (Burns & Dillon, 2005), and eat healthier and exercise more (e.g., Mahon et al., 1997) and less likely to engage in substance abuse (Keogh et al., 1999; Wills et al., 2001) than those with a present/hedonistic time perspective. As predicted, MFA moderates the relationship between temporal orientation and healthy prenatal behaviors such that women with high levels of attachment to the fetus combined with a future orientation are more likely to be committed to prenatal healthcare behaviors while those with subsequent combinations of lower levels of each of these variables engage in fewer prenatal health practices.
When hypotheses 3 and 4 were rerun using the dependent variable of condom use during pregnancy there were no significant relationships between any of the predicted variables or their interaction variables. This is true for hypothesis 6 as well, which also utilized condom use as the dependent variable. These findings are surprising because other researchers have written about condom use as a health promotion/disease prevention behavior. Given that the participants in this study were generally motivated to engage in healthy prenatal behaviors depending on their levels of MFA, LOC, and temporal orientation, it would have seemed likely that condom use may have been a logical addition to prenatal care behaviors such as smoking cessation and healthy eating. While past research has shown that knowledge does not necessarily translate to behavior (Bachanas et al., 2002; Kirby & DiClemente, 1994) it appears likely that among this sample the women may not have even considered condom use as a prenatal care behavior that was pertinent to maintaining fetal health. This becomes concerning due to the fact that the majority of the women in the study reported that they were not in committed relationships with the father of the child and either had been or were currently engaging in sexual activity with other partners. This can increase the risk of HIV or other STD infection and subsequent transmission to the fetus. Despite this, it appears that women were not motivated to use condoms as a means of ensuring their unborn child’s health. It is possible, however that the women in this study were aware of how their sexual behaviors may influence the health of the pregnancy and subsequent baby. Whereas relatively few women reported increased condom use during pregnancy, and in fact overall rates of condom use decreased during pregnancy, the majority of the participants actually decreased the number of sexual partners with whom they had contact after
confirming the pregnancy. For the purpose of this study, condom use was used as a measure of HIV and other STD prevention behavior. However, it appears that even if women in this study discontinued condom use once they became aware of the pregnancy, they were still aware of and engaging in specific behaviors designed to limit their HIV and STD exposure. This conclusion is consistent with the findings from hypothesis 7; although it was expected that MFA would be significantly associated with an increased HIV-risk perception, this was not the case. As women in this study were actively engaging in alternative (i.e., non-condom) HIV/STD risk reduction behaviors once pregnancy was confirmed, it is likely that they possessed an accurate perception of their HIV risk which was not influenced by the pregnancy status and resultant development of maternal fetal attachment.

What MFA does influence, however, is the level of a woman’s perceived power in her relationship with her main partner, which can have a significant impact on her ability to engage in risk reduction behaviors such as condom use or less frequent sexual contact. Similar to conclusions made above regarding the willingness to engage in prenatal health promotion behaviors for the sake of the child, it stands to reason that pregnant women are more likely to feel empowered to assert themselves in their relationship on behalf of the unborn child. As pregnant women with high MFA are more motivated to maintain their health for the sake of having a healthy child, so too are they more empowered in their relationships with male partners to assert their own needs for the sake of the child. It is possible that prior to pregnancy and development of MFA women are more permissive or accepting of their partner’s controlling, jealous, or other negative behavior. Similar to conclusions made above, by remaining powerless in the
relationship, a woman may believe she is only harming herself by allowing her partner to
treat her poorly or in a controlling manner. The confirmation of the pregnancy and the
development of a strong attachment to the child therefore may elicit a sense of motherly
protection that may give the woman a sense of permission to assert herself for the sake of
the new life she is bringing into the world. While this construct was studied solely in
pregnant women for the purposes of this study, it would be interesting to investigate
whether this is true only during pregnancy or whether mothers in general have a greater
sense of empowerment in their relationships when their children are in their care.

5.3 Implications for Future Research and Clinical Application

Women who already possess an internal health related locus of control and a
future oriented temporal perspective prior to pregnancy or for those in whom it develops
during pregnancy may be at an advantage in that the intrinsic motivation to maintain their
health already exists. The results of this study show that an internal LOC and a future
orientation are positively influenced by MFA in the service of engagement in prenatal
health care behaviors; however, there still exists a subset of the population of pregnant
women who lack the fundamental traits that appear to spontaneously motivate healthy
behaviors. While it may not be possible to instill these specific traits in the pregnant
women who lack them, it is possible to bring their attention to the primary goal of most
expectant mothers, which is to deliver a healthy infant.

Prenatal care providers are in the unique position of having regular access to their
pregnant patients who may not be intrinsically motivated to engage in behaviors which
would ensure a healthy birth outcome. However, for those in whom MFA does not
positively affect an external LOC or a present focused temporal orientation, yet who
presumably still want a healthy birth outcome, "preaching" the benefits of healthy behaviors may simply not be enough. In these cases, Motivational Interviewing strategies may be a useful addition to the prenatal care these women receive in order to promote healthy prenatal behaviors. More than simply using scare tactics, motivational interviewing (Miller & Rollnick, 2002) aims to create some discrepancy between an individual’s current actions and their desired outcome in order to elicit the desire to change from within the patient. The goal is for the healthcare provider to facilitate change with the impetus for change being elicited directly from the patient herself. Because Miller and Rollnick (2002) describe motivational interviewing as a "directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence," this strategy could be useful even for those women who are ambivalent about the pregnancy as evidenced by a low MFA score. It is viewed as being particularly useful for clients who are reluctant to change or who are ambivalent about changing their behavior. The strategies of motivational interviewing are generally seen as more persuasive than coercive, more supportive than argumentative, and the overall goal is to use the principles of individual responsibility, internal attribution, and cognitive dissonance to increase the patient’s intrinsic motivation so that change arises from within rather than being imposed from without (Rubak & Sandbaek, 2005).

Motivational interviewing is effective in achieving the desired results in health behavior change; in a meta-analysis of 72 randomized controlled trials with motivational interviewing as the intervention, psychologists and physicians obtained a significant effect in approximately 80% of the studies, while other healthcare providers obtained an effect in 46% of the studies. When using motivational interviewing in brief encounters of
only 15 minutes, 64% of the studies showed an effect. More than one encounter with the patient ensures the effectiveness of motivational interviewing (Rubak & Sandbaek, 2005). This strategy has been used successfully in smoking cessation (Lai et al., 2010), alcohol dependence recovery (Miller, 1983), weight loss (West et al., 2007), and HIV/AIDS medication adherence (DiLorio et al., 2003). Motivational interviewing has not been tested thoroughly in pregnant patients, although there is preliminary research which suggests it may be effective in smoking cessation interventions during pregnancy (Ondersma, Chase, Svikis, & Schuster, 2005) as well as alcohol reduction during pregnancy (Handmaker, Miller, & Manicke, 1999). Motivational interviewing has also been shown to be effective in promoting HIV risk reduction behaviors in non-pregnant young adults (Baker & Dixon, 1991).

While the current study did not find evidence to support the predictions that MFA, temporal orientation, and LOC have a significant effect on condom use behavior during pregnancy, it should be noted by prenatal healthcare providers that women may still be actively engaging in some HIV/STD risk reduction behaviors such as reducing their number of sexual partners. Many prenatal healthcare providers may assume that pregnant women are in monogamous relationships and are therefore not at risk for HIV or other STD infection. Providers should be encouraged to question women about their sexual behavior during pregnancy and to promote condom use or other methods of HIV/STD risk reduction through motivational interviewing.

Future research directions may elaborate on the current study by providing a motivational interviewing session at the first prenatal visit for a random selection of participants and investigating whether the internal traits of MFA, LOC, and temporal
orientation are receptive to this type of counseling approach. Additionally, for the purpose of this study, it has been assumed that MFA alone has increased the sense of internal LOC and future temporal orientation among those women who were committed to healthy prenatal behaviors. One way to elucidate this connection would be the inclusion of a non-pregnant comparison sample. It is difficult to know if the findings described above are unique to this sample because of their pregnant state or for some other reason. The inclusion of a non-pregnant comparison group may help further clarify some of the conclusions.

The dependent variable of condom use proved to be a non-significant dependent variable most likely due to low rates of condom use in this sample. However, simply because women in this study did not use condoms does not mean they were not aware of their HIV/STD risk and actively trying to reduce this risk. Using alternate dependent variables such as number of sexual partners or number of sexual contact occasions may be useful ways to continue to explore the general variable of HIV risk reduction without solely relying on condom use.

5.4 Limitations

This study is limited in its scope of generalizability because, although women were recruited from a clinic that primarily serves low-income minority women at high risk of HIV infection, the women who enrolled in the study seemed to possess good knowledge and implementation of HIV risk reduction behaviors, even though rates of condom use were relatively low. While the study aimed to draw conclusions about condom use as a health promotion/disease prevention strategy during pregnancy, the
majority of women did not use condoms on a consistent basis during pregnancy and instead relied on other methods of health promotion/disease prevention. Previous research has made conclusions about women with similar demographic characteristics (i.e., minority, inner-city, low income) that highlighted a lack of awareness of risk behaviors and subsequent high level of engagement in risk behaviors. Perhaps because the current sample was pregnant at the time of the study or because they were only representative of those receiving regular prenatal care, the women enrolled in this study seemed to possess higher levels of awareness of and engagement in healthy behaviors than what might be expected. This unexpected and positive finding may be attributed to successful community based HIV/STD prevention educational efforts in the greater Philadelphia area or perhaps to the dedicated efforts of the healthcare providers who work at the Women's Care Center, where the participants in this study were receiving their prenatal care.

Similarly, the women in this study generally scored high on measures of MFA and engagement in healthy prenatal care behaviors. It is possible that if recruitment had included alternate strategies, such as community recruitment through flyers or advertisements, a different type of sample would have been enrolled in the study. By recruiting from a prenatal care clinic, this study ensured that participants were all receiving excellent and consistent prenatal care and were most likely invested in the health of the child due to the clinic's commitment to have patients attend all scheduled appointments.
5.5 Conclusions

This study found a significant moderating effect of MFA on both the relationship between LOC and prenatal care behaviors as well as the relationship between temporal orientation and prenatal care behaviors. It appears that MFA significantly positively influences those women who possess a heightened sense of each health-related locus of control and a future orientation, to engage in healthy prenatal behaviors. For those women with lower levels of these variables, MFA does not consistently positively influence engagement in prenatal care behaviors. For these women, a motivational interviewing approach taken by a medical provider may help orient them to the expected desired outcome- a healthy birth. Surprisingly, hypotheses predicting a moderating effect of MFA on the relationship between each LOC and temporal orientation and HIV risk reduction through condom use were not significant. Despite this finding, it is incorrect to conclude that pregnant women in non-monogamous relationships living in an HIV epicenter are not motivated to reduce their HIV risk behaviors. Although condom use rates decreased after pregnancy was confirmed, alternate methods of HIV risk reduction increased, including reducing the number of sexual partners during pregnancy and the frequency of sexual contact. This should be taken into consideration by medical providers who treat prenatal patients as not all pregnant women are in monogamous relationships. Among those who are sexually active during pregnancy other HIV risk reduction behavior changes may be useful to promote through motivational interviewing.
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The American University, Washington, D.C.


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Pulerwitz, J., Amaro, H., De Jong, W., Gortmaker, S.L., & Rudd, R. (2002). Relationship power, condom use and HIV risk among women in the USA. *AIDS Care, 14*(6), 789-800.


associated with noncondom use among young adult African-American women. 


Table 1. Participant Demographics: Age, Ethnicity & Marital Status

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean</th>
<th>Ethnicity</th>
<th>%</th>
<th>Marital Status</th>
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<td>Married</td>
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<td>Biracial</td>
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<td></td>
<td></td>
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<td>Hispanic</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Biracial</td>
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Table 2. Intendedness and Timing of the Pregnancy

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<td>18</td>
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<tr>
<td>Unplanned</td>
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<td>82</td>
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<tr>
<td>Unwanted</td>
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<td>17.1</td>
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<table>
<thead>
<tr>
<th>Timing</th>
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<th>%</th>
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</thead>
<tbody>
<tr>
<td>Too Soon</td>
<td>48</td>
<td>70.5</td>
</tr>
<tr>
<td>Right Time</td>
<td>12</td>
<td>17.6</td>
</tr>
<tr>
<td>No preference</td>
<td>6</td>
<td>8.82</td>
</tr>
<tr>
<td>Too Late</td>
<td>2</td>
<td>2.9</td>
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</table>
Figure 1. Hypothesis 3: The moderating effect of MFA on the relationship between internal LOC and prenatal health behaviors.

$p = .02$
Figure 2. Hypothesis 4: The moderating effect of MFA on the relationship between temporal orientation and prenatal health behaviors.

$p = .016$
APPENDIX A: Measures

Pregnancy Demographic Form

A1. How old are you? ____________

A2. What is your ethnicity?
   Hispanic
   Not Hispanic

A2a. What is your race?
   American Indian or Alaska Native
   Asian
   Black or African American
   Native Hawaiian or other Pacific Islander
   White
   Biracial
   Prefer not to report

A3. Were you born in this country?
   Yes
   No

A3a. [If No, ask:] Where were you born? ________________

A3b. How old were you when you came to this country? ______ years old.

A4. What language do you speak at home? _______________________

A5. What is your current marital status?
   Never Married
   Married
   Divorced
   Widowed
   Living with Partner

A6. How many children do you have?
   ______
A7. What’s the highest year of school that you have completed, including the GED?


A8. What is your family’s income? (Remember all of this information is completely private)
   Less than $10,000
   $10,000-$25,000
   $25,000-$40,000
   More than $40,000

A9. When did you learn that you were pregnant? ________________

A10. How many weeks pregnant were you at that time? ________________

A11. Did you plan to become pregnant?
   Yes [If Yes, skip to next section]
   No

A12. Right before you became pregnant (this time), did you, yourself, want to have a(nother) baby at any time in the future?
   Yes
   No
   Not sure, don’t know
   Didn’t care

A13. So would you say you became pregnant too soon, at about the right time, or later than you wanted?
   Too soon
   Right time
   Later
   Didn’t care

A14. What, if anything, were you doing to prevent pregnancy?
   Nothing
   Using male condoms
   Using female condoms
   Using a hormonal method: pill, patch, ring, depo provera or Norplant.
   Using the sponge
   Using spermicidal foam or lubricant (like N-9)
   Using the withdrawal method
   Using the rhythm method
   Douching after sex
Practicing Oral Sex
Practicing Anal Sex
Other: __________________
Now I am going to ask you some questions about certain sexual behaviors you may have engaged in before or since you learned that you were pregnant.

A15. How many male partners have you had vaginal, anal, or oral sex with in the **6 months before** learning that you were pregnant?

How many of these male partners.....

A16a....have been in jail in the last 10 years?

A16b....have had sex with other women in the last year?

A16c....have had sex with other men in the last year?

A16d....have used intravenous (injected) drugs in the last 10 years?

A16e....have been diagnosed with a sexually transmitted disease such as (list here) in the last year?

A16f....have been diagnosed with HIV in the last year?

A17. In the **6 months prior to becoming pregnant** how many times have you engaged in vaginal, anal or oral sex with a male partner? This may be easier to think about in terms of per day, per week, or per month. [**PROBE:** Did you have sex during the week of your period?]______times

A18. Of the _____ times you had sex, how many times have you used male or female condoms in the **6 months** prior to becoming pregnant?

# of times______

A18a. If Never, Why not? (check all that apply)
I was trying to get pregnant
Partner just doesn’t want to
It ruins the moment for me
It ruins the moment for my partner
It is uncomfortable for me
It is uncomfortable for my partner
I’m in a monogamous relationship
I felt my partner(s) was/were safe
Other: ________________________________
Now I am going to ask you some questions about your sexual behaviors since learning that you were pregnant.

B1. How many male partners have you had vaginal, anal, or oral sex with since learning that you were pregnant?


B2. [If more than one partner] Is one of these a main partner, like a husband or boyfriend?

  Yes
  No

How many of these male partners…..

<table>
<thead>
<tr>
<th></th>
<th>Main</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3c.</td>
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<td></td>
</tr>
<tr>
<td>B3d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3e.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3f.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B4. Has this partner ever refused to use a male condom during vaginal or anal sex?

  Yes
  No
B5. Since you found out that you were pregnant how many times have you engaged in vaginal, anal or oral sex with a male partner? This may be easier to think about in terms of per day, per week, or per month.

_____ times

B6. Of the _____ times that you had sex, how often have you used male or female condoms since you learned that you were pregnant?

# of times______

B6a. [If Never] Why not? (check all that apply)

I’m already pregnant
I’m in a monogamous relationship
I felt my partner(s) was/were safe
I had never used condoms before I became pregnant
Other: ___________________________________

B7. In the past, when you have used condoms, what was your main reason for using them?

Pregnancy prevention
STD/HIV prevention
Both pregnancy and STD/HIV prevention
Partner insisted
Other: _________________________________

B8. Since you learned you were pregnant, have you changed your behavior at all to reduce your risk for HIV exposure?

Yes
No [Skip to next section]

B8a. If yes, what have you done?

Started using male condoms more often
Started using female condoms more often
Stopped having sex with partners other than my main partner
I asked my partner to get tested
Started using the withdrawal method
Started douching after sex
Now I am going to ask you some questions about your pregnancy history.

C1. You already told me that you have _____ children. How many times have you been pregnant whether you’ve had a baby or not?

     #_______

C2. [If # of children and # of pregnancies are inconsistent, ask:] How many abortions or miscarriages have you had?

     #_______ abortions     #_______ miscarriages
MATERNAL ANTENATAL ATTACHMENT SCALE

These questions are about your thoughts and feelings about the developing baby. Please tick one box only in answer to each question.

1) Over the past two weeks I have thought about, or been preoccupied with the baby inside me:

☐ Almost all the time
☐ Very frequently
☐ Frequently
☐ Occasionally
☐ Not at all

2) Over the past two weeks when I have spoken about, or thought about the baby inside me I got emotional feelings which were:

☐ Very weak or non-existent
☐ Fairly weak
☐ In between strong and weak
☐ Fairly strong
☐ Very strong

3) Over the past two weeks my feelings about the baby inside me have been:

☐ Very positive
☐ Mainly positive
☐ Mixed positive and negative
☐ Mainly negative
☐ Very negative
4) **Over the past** two weeks I have had the desire to read about or get information about the developing baby. This desire is:

- [ ] Very weak or non-existent
- [ ] Fairly weak
- [ ] Neither strong nor weak
- [ ] Moderately strong
- [ ] Very strong

5) **Over the past** two weeks I have been trying to picture in my mind what the developing baby actually looks like in my womb:

- [ ] Almost all the time
- [ ] Very frequently
- [ ] Frequently
- [ ] Occasionally
- [ ] Not at all

6) **Over the past** two weeks I think of the developing baby mostly as:

- [ ] A real little person with special characteristics
- [ ] A baby like any other baby
- [ ] A human being
- [ ] A living thing
- [ ] A thing not yet really alive

7) **Over the past** two weeks I have felt that the baby inside me is dependent on me for its well-being:

- [ ] Totally
- [ ] A great deal
8) Over the past two weeks I have found myself talking to my baby when I am alone

☐ Not at all
☐ Occasionally
☐ Frequently
☐ Very frequently
☐ Almost all the time I am alone

9. Over the past two weeks when I think about (or talk to) my baby inside me, my thoughts:

☐ Are always tender and loving
☐ Are mostly tender and loving
☐ Are a mixture of both tenderness and irritation
☐ Contain a fair bit of irritation
☐ Contain a lot of irritation

10. The picture in my mind of what the baby at this stage actually looks like inside the womb is:

☐ Very clear
☐ Fairly clear
☐ Fairly vague
☐ Very vague
☐ I have no idea at all
11. **Over the past** two weeks when I think about the baby inside me I get feelings which are:

- [ ] Very sad
- [ ] Moderately sad
- [ ] A mixture of happiness and sadness
- [ ] Moderately happy
- [ ] Very happy

12. Some pregnant women sometimes get so irritated by the baby inside them that they feel like they want to hurt it or punish it:

- [ ] I couldn’t imagine I would ever feel like this
- [ ] I could imagine I might sometimes feel like this, but I never actually have
- [ ] I have felt like this once or twice myself
- [ ] I have occasionally felt like this myself
- [ ] I have often felt like this myself

13. **Over the past** two weeks I have felt:

- [ ] Very emotionally distant from my baby
- [ ] Moderately emotionally distant from my baby
- [ ] Not particularly emotionally close to my baby
- [ ] Moderately close emotionally to my baby
- [ ] Very close emotionally to my baby

14. **Over the past** two weeks I have taken care with what I eat to make sure the baby gets a good diet:

- [ ] Not at all
- [ ] Once or twice when I ate
Occasionally when I ate
Quite often when I ate
Every time I ate

15. When I first see my baby after the birth I expect I will feel:

- Intense affection
- Mostly affection
- Dislike about one or two aspects of the baby
- Dislike about quite a few aspects of the baby
- Mostly dislike

16. When my baby is born I would like to hold the baby:

- Immediately
- After it has been wrapped in a blanket
- After it has been washed
- After a few hours for things to settle down
- The next day

17. Over the past two weeks I have had dreams about the pregnancy or baby:

- Not at all
- Occasionally
- Frequently
- Very frequently
- Almost every night
18. **Over the past** two weeks I have found myself feeling, or rubbing with my hand, the outside of my stomach where the baby is:

- [ ] A lot of times each day
- [ ] At least once per day
- [ ] Occasionally
- [ ] Once only
- [ ] Not at all

19. **If the pregnancy** was lost at this time (due to miscarriage or other accidental event) without any pain or injury to myself, I expect I would feel:

- [ ] Very pleased
- [ ] Moderately pleased
- [ ] Neutral (i.e. neither sad nor pleased; or mixed feelings)
- [ ] Moderately sad
- [ ] Very sad
Maternal Attitudes and Maternal Adjustment Scale

Please complete each question by putting a circle around the answer which most closely applies to you. Work quickly and please remember to answer each question. We want to know how you have been feeling during the past month. If you have not considered some of the questions during the past month, answer them based on your present feelings.

1. Have you been worrying that you might not be a good mother?    Not at all   A little   A lot   Very much

2. Having you been worrying about hurting your baby inside you?    Not at all   A little   A lot   Very much

3. Has it worried you that you may not have any time to yourself once your baby is born?    Not at all   A little   A lot   Very much

4. Have you regretted being pregnant?    Never   Rarely   Often   Very Often

5. Has the thought of wearing maternity clothes appealed to you? Very much   A lot   A little   Not at all

6. Have you been feeling happy that you are pregnant? Not at all   A little   A lot   Very much

7. Has the thought of having more children appealed to you? Not at all   A little   A lot   Very much

8. Have you felt that pregnancy was unpleasant? Very much   A lot   A little   Not at all

9. Have you been looking forward to caring for your baby’s needs? Not at all   A little   A lot   Very much

10. Have you been wondering whether your baby will be healthy and normal? Not at all   A little   A lot   Very much

11. Have you felt that life will be more difficult after the baby is born? Not at all   A little   A lot   Very much

12. Has the thought of breastfeeding your baby appealed to you? Not at all   A little   A lot   Very much
AIDS Multidimensional Health Locus of Control Scale

This set of statements involves opinions about the AIDS/HIV virus. Please indicate how much you agree with each statement from 1= strongly disagree to 5= strongly agree. Please don’t skip any questions.

<table>
<thead>
<tr>
<th>Strongly Disagree 1</th>
<th>Disagree 2</th>
<th>Neutral 3</th>
<th>Agree 4</th>
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<td>I am in control of whether I get the AIDS virus</td>
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<tr>
<td>If I get the AIDS virus, it’s a matter of fate</td>
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</tr>
<tr>
<td>Other people play a big role in whether I get the AIDS virus</td>
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<tr>
<td>If I take the right steps, I can avoid the AIDS virus</td>
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<tr>
<td>If it’s meant to be, I will get the AIDS virus</td>
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<tr>
<td>More than anything else, chance determines whether I get the AIDS virus</td>
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<tr>
<td>Whether or not I get the AIDS virus depends on what my sexual partner wants to do</td>
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<tr>
<td>My own behavior determines whether I get the AIDS virus</td>
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</tr>
<tr>
<td>Whether I get the AIDS virus is determined by other people</td>
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</tbody>
</table>
Perceived Risk Scale

Please indicate how strongly you agree with each of the following statements from 1= strongly disagree to 5= strongly agree. Please don’t skip any questions.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am afraid of getting AIDS</td>
<td></td>
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<tr>
<td>I am not worried about getting AIDS</td>
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<tr>
<td>I am less likely than most people to get AIDS</td>
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<tr>
<td>I am not the kind of person who is likely to get AIDS</td>
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<tr>
<td>I would rather get any other disease than AIDS</td>
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<tr>
<td>I consider myself a member of an AIDS high risk group</td>
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</tbody>
</table>
The Sexual Relationship Power Scale

The following questions pertain to your relationship with your main partner. This person may be your husband, boyfriend, or lover. If you do not have a main partner, answer these questions for the partner with whom you have sex most frequently.

Please indicate how much you agree with each statement from 1= strongly agree to 4= strongly disagree. Please don’t skip any questions.

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Strongly Agree 1</th>
<th>Agree 2</th>
<th>Disagree 3</th>
<th>Strongly Disagree 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>If I asked my partner to use a condom, he would get violent.</td>
<td></td>
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<tr>
<td>2.</td>
<td>If I asked my partner to use a condom, he would get angry.</td>
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<tr>
<td>3.</td>
<td>Most of the time, we do what my partner wants to do.</td>
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<td>4.</td>
<td>My partner won’t let me wear certain things.</td>
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<tr>
<td>5.</td>
<td>When my partner and I are together, I am pretty quiet.</td>
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<tr>
<td>6.</td>
<td>My partner has more say than I do about important decisions that affect us.</td>
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<tr>
<td>7.</td>
<td>My partner tells me who I can spend time with.</td>
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<tr>
<td>8.</td>
<td>If I asked my partner to use a condom, he would think I am having sex with other people.</td>
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<tr>
<td>9.</td>
<td>I feel trapped or stuck in our relationship.</td>
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<tr>
<td>10.</td>
<td>My partner does what he wants, even if I do not want him to.</td>
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<tr>
<td>11.</td>
<td>I am more committed to our relationship than my partner is.</td>
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<tr>
<td>12.</td>
<td>When my partner and I disagree, he gets his way most of the time.</td>
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<tr>
<td>13.</td>
<td>My partner gets more out of our relationship than I do.</td>
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<tr>
<td>14.</td>
<td>My partner always wants to know where I am.</td>
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<tr>
<td>15.</td>
<td>My partner might be having sex with someone else.</td>
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</tbody>
</table>
Zimbardo Time Perspective Inventory

*Read each item and, as honestly as you can, answer the question: “How characteristic or true is this of you?” Check the appropriate box using the scale.*

<table>
<thead>
<tr>
<th></th>
<th>Very Untrue</th>
<th>Neutral</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I believe that getting together with friends to party is one of life’s important pleasures.</td>
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<tr>
<td>6. I believe that a person’s day should be planned ahead each morning.</td>
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<td>8. I do things impulsively.</td>
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<tr>
<td>9. If things don’t get done on time, I don’t worry about it.</td>
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<tr>
<td>10. When I want to achieve something, I set goals and consider specific means for reaching those goals.</td>
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<tr>
<td>12. When listening to my favorite music, I often lose all track of time.</td>
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<tr>
<td>13. Meeting tomorrow’s deadlines and doing other necessary work comes before tonight’s play.</td>
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<tr>
<td>17. I try to live my life as fully as possible, one day at a time.</td>
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<tr>
<td>18. It upsets me to be late for appointments.</td>
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<tr>
<td>19. Ideally, I would live each day as if it were my last.</td>
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<tr>
<td>21. I meet my obligations to friends and authorities on time.</td>
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<tr>
<td>23. I make decisions on the spur of the moment.</td>
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<tr>
<td>26. It is important to put excitement in my life.</td>
<td></td>
<td></td>
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<tr>
<td>28. I feel that it’s more important to enjoy what you’re doing than to get work done on time.</td>
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<tr>
<td>30. Before making a decision, I weigh the costs against the benefits.</td>
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<tr>
<td>31. Taking risks keeps my life from becoming boring.</td>
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<tr>
<td>32. It is more important for me to enjoy life’s journey than to focus only on the destination.</td>
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<tr>
<td>40. I complete projects on time by making steady progress.</td>
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<tr>
<td>42. I take risks to put excitement into my life.</td>
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<tr>
<td>43. I make lists of things to do.</td>
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<tr>
<td>44. I often follow my heart more than my head.</td>
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<tr>
<td>45. I am able to resist temptations when I know that there is work to be done.</td>
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<tr>
<td>46. I find myself getting swept up in the excitement of the moment.</td>
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<tr>
<td>48. I prefer friends who are spontaneous rather than predictable.</td>
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<tr>
<td>51. I keep working at difficult, uninteresting tasks if they will help me get ahead.</td>
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<tr>
<td>55. I like my close relationships to be passionate.</td>
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<tr>
<td>56. There will always be time to catch up on my work.</td>
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</tbody>
</table>
As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

1. I have been able to laugh and see the funny side of things
   ___ As much as I always could
   ___ Not quite so much now
   ___ Definitely not so much now
   ___ Not at all

2. I have looked forward with enjoyment to things
   ___ As much as I ever did
   ___ Rather less than I used to
   ___ Definitely less than I used to
   ___ Hardly at all

*3. I have blamed myself unnecessarily when things went wrong
   ___ Yes, most of the time
   ___ Yes, some of the time
   ___ Not very often
   ___ No, never

4. I have been anxious or worried for no good reason
   ___ No, not at all
   ___ Hardly ever
   ___ Yes, sometimes
   ___ Yes, very often

*5 I have felt scared or panicky for no very good reason
   ___ Yes, quite a lot
   ___ Yes, sometimes
   ___ No, not much
   ___ No, not at all
*6. Things have been getting on top of me

_____ Yes, most of the time I haven’t been able to cope at all
_____ Yes, sometimes I haven’t been coping as well as usual
_____ No, most of the time I have coped quite well
_____ No, I have been coping as well as ever

*7. I have been so unhappy that I have had difficulty sleeping

_____ Yes, most of the time
_____ Yes, sometimes
_____ Not very often
_____ No, not at all

*8. I have felt sad or miserable

_____ Yes, most of the time
_____ Yes, quite often
_____ Not very often

*9. I have been so unhappy that I have been crying

_____ Yes, most of the time
_____ Yes, quite often
_____ Only occasionally

*10. The thought of harming myself has occurred to me

_____ Yes, quite often
_____ Sometimes
_____ Hardly ever
_____ Never
Dr. Levine Kornfield was born in Baltimore, Maryland. She received her B.A. (2003) in Psychology from Barnard College, Columbia University in New York City, where she was the recipient of the April Benson '63 Psychology Award in 2002. Dr. Kornfield went on to receive her M.S. (2008) and Ph.D. (2010) in Clinical Psychology from Drexel University in Philadelphia. While at Drexel, she taught undergraduate classes, held positions at clinical practica, and was the recipient of several academic awards for her research at local and national conferences. She completed her predoctoral internship at the Veteran's Affairs Medical Center in Northport, NY and will commence a postdoctoral fellowship at the Veteran's Affairs Medical Center in Philadelphia. See below for a selection of published works:

