INFLUENCES ON CONTRACEPTIVE USE AMONG
COLLEGE WOMEN

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By

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INFLUENCES ON CONTRACEPTIVE USE AMONG COLLEGE WOMEN

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ABSTRACT

**Background:** An unintended pregnancy (UIP) occurs before an ideal time or is completely unwanted. In 2011, the rate of UIP in the United States was 49% of all pregnancies. Unintended pregnancies are expensive to society and result in poorer health outcomes for the woman and the infant. Women in the following groups have the highest rates of UIP: aged 20-24; unmarried and co-habitating; income below the poverty level; educational level less than a high school diploma; and, Black or Latina women. Contraceptive use prevents UIP, but many women do not use contraception, especially the highly effective long-acting reversible forms of contraception. **Purpose:** This descriptive, cross-sectional study examined the relationship between background factors, attitudes, perceived norms, and self-efficacy and the intent to use contraception. Secondly, this study examined the relationship between background factors, intent to use contraception, environmental factors, competency, and reported use of contraception. Finally, this study aimed to establish the validity and reliability of the survey instrument, Influences on Birth Control Use (IBCU). **Methods:** Participants were a convenience sample of 270 women ages 18-24 attending a large public university or community college in the Midwest. Participants completed a paper survey. The integrated behavioral
model provided a framework for factors associated with intent to use contraception and reported contraception use. **Results:** IBCU was found to have reliable sub-scales, especially for attitude and self-efficacy toward contraceptive use. For each one point increase in the attitude scale score, the odds that a participant did not intend to use contraception declined. If a participant reported a rural childhood, they were more likely to report they did not intend to use contraception. If a participant intended to use contraception, they were 15 times more likely to report contraceptive use, and if a participant had health insurance that paid for contraception, they were six times more likely to report contraceptive use. **Conclusions:** Understanding social differences in rural areas allows providers to offer sensitive reproductive health care to women from those areas. Decreasing the cost of contraception will increase the number of women who use contraception. Men should be included in research on contraception in future.
The faculty listed below, appointed by the Dean of the School of Nursing have examined a dissertation titled “Influences on Contraceptive Use Among College Women,” presented by Valerie Gwen Bader, candidate for the Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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CHAPTER 1

Introduction

Nearly 50% of pregnancies in the United States are unintended (Finer & Henshaw, 2006). Because of poor health outcomes for infants and their mothers, unintended pregnancy is a major public health concern (United States Department of Health and Human Services, 2010). For example, infants from an unintended pregnancy are more likely to be born low-birth weight, premature, and experience failure to thrive during infancy and to have higher rates of child abuse and mortality than those from planned pregnancies (Gipson, Koenig, & Hendin, 2008). Women with an unintended pregnancy enter prenatal care later in the pregnancy, have higher rates of substance abuse during the pregnancy, and experience more postpartum depression and anxiety following delivery (Cheng, Schwarz, Douglas, & Horon, 2009). Healthy People 2020 reports that rates of UIP are highest in the US among women ages 18-24, women who are cohabitating; women whose income is below the poverty line; women with less than a high school diploma; and black or Hispanic women (United States Department of Health and Human Services, 2012). An important family planning objective identified in Healthy People 2020 is to increase the proportion of pregnancies that are intended to 56%.

An unintended pregnancy is defined as one that is unwanted or that occurs mistimed, sooner than the woman wanted it (Santelli, Lindberg, Orr, Finer, & Speizer, 2009). Recently, the definition of a mistimed pregnancy has differentiated between pregnancies that are seriously mistimed (by more than two years) and pregnancies that are mistimed (by less than two years) (Mosher, Jones, & Abma,
Negative consequences of an UIP are more severe if a pregnancy is seriously mistimed. Approximately half of unintended pregnancies end in abortion (Finer & Zolna, 2011).

Current research on UIP assumes that people plan their pregnancies and see themselves as in control of their reproductive abilities. This may not be the case for all people, however. (Bleil et al., 2011) documented that women who report serious childhood adversity have higher rates of UIP. Additionally, research has documented reproductive coercion on the part of male partners contributes to UIP (Miller et al., 2010). Psychosocial factors such as perceived low risk of pregnancy, depression, anxiety, smoking, obesity, and not engaging in other health promotion behaviors, all predicted an increased risk for UIP (Ayoola, Nettleman, & Brewer, 2007); (Xaverius, Tenkku, & Salas, 2009).

Unintended pregnancy can be prevented by using contraception correctly and consistently; however, the majority of women reporting an unintended pregnancy did not use contraception, or used it incorrectly, at the time that they became pregnant (Homco, Peipert, Secura, Lewis, & Allsworth, 2009). According to the integrated behavioral model, the best predictor of using contraception correctly and consistently is whether or not one intends to use contraception (Montano & Kasprzyk, 2008, p77-8). The intention to use contraception is influenced by attitudes toward the behavior of contraceptive use, social norms toward contraceptive use, and perceived self-efficacy around contraceptive use. Once a person intends to use contraception, their intention is supported or hindered by their actual competency at using contraception and environmental factors. For example, a woman may believe she is capable of
using an oral contraceptive pill to prevent pregnancy, but if she misplaces her phone
several times each week, and therefore does not hear the reminder alert, she may not
actually be able to carry out my intention to take a pill at the same time each day.
Because correct and consistent contraceptive use can prevent unintended pregnancy, a
better understanding of how to influence young women to use contraceptives
correctly and consistently is essential.

**Study Purpose and Research Questions**

Based on the integrated behavioral model, this research will describe the
association between the intention to use contraception and attitudes toward
contraceptive use, perceived norms regarding contraception, and self-efficacy beliefs.
This research will also describe the association between intention to use
contraception, actual competency, environmental factors and reported use of
contraception. The purpose of this study is to improve knowledge about components
of contraceptive decision making so that nurses can develop clinical and educational
interventions that effectively address the high rate of UIP among women ages 18-24.
The specific aim of this study is to explore the contraception use patterns among
young women (ages 18-24) and their relationship to attitudes toward contraceptive
behavior, perceived norms regarding contraception behavior, and self-efficacy
regarding contraception behavior. The research questions guiding this study are: (1)
what is the relationship between attitudes, perceived norms, and self-efficacy and the
intention to use contraception correctly and consistently? And (2) what is the
relationship between intention to use contraception correctly and consistently,
competency, and environmental factors and reported contraception behavior? And (3)
do background variables (age, ethnicity, rural vs. urban residence, and socio-economic status) contribute to intention to use contraception, and reported contraceptive behavior, over and above the independent variables (attitudes, perceived norms, self-efficacy, competence, and environmental factors)? Finally, a factor analysis will be conducted to determine the validity and reliability of the instrument: *Influences on Birth Control Use*.

**Definition of Terms**

**Unintended pregnancy**: a pregnancy that is sooner than the woman wanted it (mistimed), or a pregnancy that occurs when a woman did not want a baby, or a baby of that birth order (unwanted) (Mosher et al., 2012).

**Attitudes**: A person’s evaluation of how favorable or unfavorable the outcomes would be after he or she performed a particular behavior (Yzer, 2012, p. 24; Fishbein, 2008, p. 839).

**Perceived social norms**: The social pressure one expects to perform, or not perform the behavior. Perceived social norms includes two aspects: whether or not significant others expect one to perform the behavior (injunctive norm), and whether or not they themselves are performing the behavior (descriptive norm) (Yzer, 2012, p. 24).

**Self-efficacy**: This refers to the extent to which one perceives they can perform the behavior, despite obstacles (Fishbein, 2008, p. 839).

**Intention**: A readiness to engage in a particular behavior. Intention to perform a behavior is predicted by attitudes toward the behavior, perceived social norms regarding the behavior, and self-efficacy regarding the behavior.
**Competence**: Actual skills and ability (Fishbein, 2008).

**Environmental factors**: Barriers that prevent people from acting on their intentions (Fishbein, 2008).

**Contraception**: Deliberate prevention of pregnancy by using behaviors, devices or hormones to prevent fertilization of an ovum, or implantation of a fertilized ovum into the endometrial lining.

**Assumptions**

Based on the integrated behavioral model, this study will assume the following:

1. Young women intend to use contraception, depending on their attitudes toward use of contraception, their perceived social norms about use of contraception and their self-efficacy beliefs regarding contraceptive use.

2. Young women will use contraception, if they intend to, so long as they are competent to use contraception and environmental factors do not prevent them from using contraception.

3. Factor analysis assesses construct validity, and can identify the relevant items in a survey on contraceptive use.

4. Once the influence (on contraceptive use) of attitudes, social norms, self-efficacy, competency, and environmental factors are understood, policy and educational interventions can be developed that will improve contraceptive use.

**Limitations**

Potential limitations of this study include limitations common to all cross-sectional studies.
1. Cross sectional studies suggest relationships between variables that are associations, rather than causative (Gordis, 2009, p. 198).

2. Survey research relies on self-report, which may be inaccurate because the participants want to please the researcher (Polit & Beck, 2010, p. 294). Additionally, recall bias may occur.

3. Information obtained from cross-sectional surveys can be superficial, and fail to capture the complexity of the behavior being studied (Polit & Beck, 2010, p. 295).

4. The convenience sampling method to find participants may limit the generalizability of the findings of this research.

**Significance**

The findings from this study will illustrate which personal attitudes, social norms, self-efficacy beliefs, intention to use contraception, competency, and environmental factors are associated with consistent contraceptive use, within different socio-economic reference groups. Knowing more about which attitudes, perceived norms, and self-efficacy beliefs influence contraceptive behavior helps nurses provide relevant information to clients in a clinical and community setting. While evidence suggests some effective pregnancy prevention educational strategies for teens, the literature lacks research on effective education to increase contraceptive use and prevent unintended pregnancy among young adults (Kirby, 2009). Second, findings from this study can be used to design and test intervention strategies directed at the specific factors that prevent correct and consistent contraceptive use. By increasing the correct and consistent use of contraception, we can reduce unintended
pregnancy, which prevents the negative health consequences for the mother and the increased morbidity and mortality rates for the child.

CHAPTER 2
A REVIEW OF THE LITERATURE

Operationalizing Unintended Pregnancy

An unintended pregnancy (UIP) either occurs before an ideal time or is completely unwanted (Santelli et al., 2009). This measure of unintended pregnancy, also known as the standard measure, has been in use since the 1965 National Fertility Survey that classified pregnancy into three broad categories: intended; mistimed; and unwanted (Bumpass & Westhoff, 1970). In the 1965 National Fertility Survey interviewers asked respondents to think back to the circumstances that existed when they found out they were pregnant: were they using contraception and did they want to be pregnant at that time? If they did not want to be pregnant at that time, respondents were then asked whether they wanted a child at some time in the future. Intended pregnancies occurred when women wanted to be pregnant at that time. Mistimed pregnancies occurred when women wanted a child, but not at that time. Unwanted pregnancies occurred when women did not want to be pregnant, and did not want a child in the future.

Currently, the National Survey of Family Growth (NSFG) provides the most comprehensive assessment of the rate of unintended pregnancy in the United States. Initially, the purpose of the NSFG was to provide reliable national data on marriage,
divorce, contraception, infertility, and the health of women and infants. The most recent survey, concluding in June 2010, included an assessment of attitudes toward marriage, children, and families, but also information regarding behavior related to sexually transmitted infection risk and men’s roles in raising and supporting their children (Centers for Disease Control and Prevention, 2012). Since 1973, NSFG research assistants have interviewed women aged 15-44, in their homes, every three to six years. Beginning in 2002, the NSFG began surveying men as well as women. The results of the NSFG survey that concluded in June 2010, are based on a national sample of 22,682 men and women, ages 15-44 living in households in the United States. Survey questions used to measure unintended pregnancy for women are very detailed and include the following: how many times have you been pregnant; how did each pregnancy resolve; on a scale of one to ten, how happy were you to find out you were pregnant; and thinking back to the time you found out you were pregnant, would you say you wanted a baby at that time or in the future; did you want to be pregnant at that time; and how much sooner than you wanted did you get pregnant. Women were also asked to report their perceptions of how happy their partners were about the pregnancy and the timing of the pregnancy (National Survey of Family Growth, 2006). This current measure of unintended pregnancy, while imperfect, identifies the conditions in which men and women bear children and seeks to inform policies that support fertility control (Campbell & Mosher, 2000).

Beginning in 2010, the NSFG began to include data on how “mistimed” a mistimed pregnancy was (Mosher et al., 2012). Expanding the definition of unintended pregnancy was necessary because important differences exist between
pregnancies mistimed by more than two years (seriously mistimed), and those that are mistimed by less than two years (moderately mistimed). One notable difference is that unwanted and seriously mistimed pregnancies occur more frequently among the following groups of women: teen-agers (77% of pregnancies are unintended, 51% are seriously mistimed), unmarried women, not co-habitating (76% of pregnancies are unintended), and women of Hispanic descent (35% of pregnancies are unintended) or African-American descent (45% of pregnancies are unintended) (Mosher et al., 2012).

Conceptual problems with the measurement of UIP in the 1965 National Fertility Survey persist and weaken the results of the current NSFG survey results. To begin with, both the 1965 and the 2010 surveys assume that couples have an ideal family size in mind, and then control their fertility to achieve that goal. In this model, family planning is conceptualized as having a pre-determined goal, resulting in intentional contraceptive use or non-use, which in turn results in a desired family size. The family planning process proceeds in a temporal, logical order (Ryder, 1973). In fact, what one considers to be the ideal family size surely changes as one ages and as life circumstances change. Yet, this logically ordered model of family planning persists in current measures of unintended pregnancy.

Another conceptual problem with the standard definition of unintended pregnancy is that the standard definition links contraceptive behavior with pregnancy intention, though studies have shown pregnancy intention may or may not predict contraceptive behavior (Ahluwalia, Whitehead, & Bensyl, 2007; Santelli et al., 2009).
pregnancy and childbearing are common. In addition, what motivates people to engage in sexual activity that can result in pregnancy is likely very different than what motivates people to bear children (Santelli et al., 2003). Women likely choose to engage in sexual activity with men they would not necessarily choose to raise children with. But the standard definition of unintended pregnancy implies that there will be an ideal time and an ideal partner with whom one would both engage in sexual activity and become pregnant. The ideal partner and time may not arrive for all women, or may be different, depending on their immediate goals (Lifflander, Gaydos, & Hogue, 2007; Santelli, et al., 2009).

The sample populations most of our knowledge on UIP derive from limit our findings and subsequent knowledge. Surveys on unintended pregnancy sample women ages 15-45, who agree to participate and who researchers have access to (Ryder, 1973). This sampling strategy fails to capture young women who are not in conventional living arrangements and/or not affiliated with large institutions like colleges, the military, or family planning clinics. Another problem with the sampling for unintended pregnancy surveys are that men have been historically absent. Both the 1965 National Fertility Survey, and the NSFG survey data collected before 2002 relied on the woman’s attitude regarding pregnancy, and asked her about her male partner’s desire for a child. This is problematic because while men have not been directly included in family planning research, in daily life they certainly play a role (Melchionne, 2010). This oversight is beginning to change. Since 2002 men have been included in the NSFG survey, and the survey data from 2006-2010 includes the responses of more than 10,000 men (Centers for Disease Control and Prevention,
Questions used to ask men about UIP include: birth control used with all sex partners; birth control used by female partners; number of biological children; possibility of having fathered children unknowingly; desire for children prior to learning partner was pregnant; and, did partner’s pregnancies occur at the right time, or too soon? Unlike the survey for women, men are not asked to report how happy about or wanted the pregnancy was by their female partners.

Another criticism of the standard definition of unintended pregnancy is that most data on pregnancy timing and intention is collected retrospectively. Retrospective data collection is problematic because descriptions of pregnancy intent have been shown to change during the pregnancy (Joyce, Kaestner, & Korenman, 2000). Further, some women may not have considered whether they wanted to be pregnant prior to finding out that they were in fact pregnant (Ryder, 1973). In a retrospective survey, women report their current state of mind regarding their previous intentions, with full knowledge of how things turned out. As Joyce, Kaestner, and Korenman note, a smiling baby may result in a more positive recollection of past intentions (2000). Therefore questions about pregnancy intention may reflect the final outcome, not the process of arriving at that outcome. Stated another way, retrospective reports of early pregnancy intentions may only reflect whether a woman eventually adjusted to a pregnancy. For example, in survey data collected at the time a pregnancy test was taken, before pregnancy was confirmed, an inconsistent relationship existed between pregnancy intentions and happiness about the pregnancy (Sable & Libbus, 2000). Currently however, an analysis of NSFG data cannot determine how correlated pre-pregnancy intentions are to subsequent
pregnancy adjustment. To address this issue, the most recent NSFG survey questions women and men about how happy they were to learn of the pregnancy, in addition to whether they wanted the pregnancy. But to fully understand pregnancy intention prior to a pregnancy, more information is needed. Because prospective questions about the desire for future children are not good predictors of retrospective intention status, Schwartz, et al (2010) encourage researchers to question not just whether pregnancy is wanted in the future, but when in the future.

Finally, the NSFG, the primary measure of UIP in the US, does not address the perceived level of reproductive control women or men have. Perceived reproductive control is emerging as an important factor in predicting unintended pregnancy. (Belsky, Steinberg, Houts, & Halpern-Fisher, 2010) showed an association between early maternal harshness and risky behavior at age 15 in a prospective, longitudinal survey of 526 mother-daughter pairs. Maternal harshness was defined as mothers who spanked their children; expected unquestioning obedience; expected the child to be quiet and respectful around adults; and regarded respect for authority as the most important thing for a child to learn. Maternal harshness was associated with early menarche ($X^2=-0.23, p<0.0001$), increased sexual risk taking ($X^2=0.11, p<0.05$) and an increase in other risk taking behaviors ($X^2=0.19, p<0.0001$). The authors interpret these findings as support for the evolutionary theory of socialization. This theory posits that individuals raised in an environment of risk and uncertainty mature more quickly, bear more offspring, and limit their parental investment. Maturing more quickly and breeding promiscuously, while not investing heavily in parenting is perceived as ensuring more future progeny by women with
harsher mothers. These women learned in early childhood that the future was precarious, others could not be trusted, and intimate relationships were not enduring (Belsky et al., 2010).

Bleil et al., (2011) also found support for the theory that childhood adversity predicts low perceived control of reproduction in adolescence and adulthood. These authors interviewed 259 reproductive aged women and compared their abortion history with the experience of childhood stressors of abuse (physical and sexual), family disruption (parental death, divorce, addiction, mental illness, and witnessing violence) and threats to personal safety (having a serious illness, injury, or accident, or witnessing a robbery, violence, or being physically assaulted). Among the 89 women reporting having had an abortion, 48.3% had two or more abortions. Women who had one abortion (compared to women with no abortions) had increased odds of having experienced family disruption (OR 1.34, CI 1.00-1.79). Women who had two or more abortions (compared to women who had no abortions) had increased odds of having experienced abuse (OR 5.83, CI 1.71-19.89), family disruption (OR= 1.75, CI= 1.14-2.69), and threats to personal safety (OR= 2.74, CI= 1.29-5.82). Finally, compared to women who had one abortion, women with two or more abortions had increased childhood experiences of abuse, especially sexual abuse (OR 9.21, CI 1.70-48.97, p=0.010) and threats to their personal safety (OR =2.23, CI 1.03-4.81, p=0.042).

The studies cited above by Belsky, et al., and Bleil, et al., point to causative factors that predict unintended pregnancy, and suggest that the causes of future UIP have their origins in early childhood. Currently, the most recent NSFG data collected
information about the marital status of biological parents, and the participant’s relationship with their childhood maternal and paternal figure. What the parental figure’s level of education and age were when first giving birth are also asked. These questions do not provide detailed information regarding childhood adversity or maternal harshness, but they are a step in the right direction.

Despite the conceptual and measurement criticisms of UIP, the high rate of UIP deserves research attention for two important reasons. First, UIP is expensive to society, and second UIP is a cause of poor maternal child health outcomes (United States Department of Health and Human Services, 2010). The costs to federal and state governments for births that result from UIP in the US exceed $11 billion annually (Sonfield, Kost, Benson, & Finer, 2011). UIP, as defined by being unwanted or mistimed, has poorer outcomes for both the mother and the infant (Gipson et al., 2008). Specifically, unintended births are associated with delayed prenatal care, smoking during pregnancy, not breastfeeding the baby, poorer health during childhood and poorer outcomes for the mother (Mosher et al., 2012).

**Impact of Unintended Pregnancy**

Gipson et al., (2008) reviewed the available literature on the maternal and child health consequences of unintended pregnancy both in developing and developed countries, including the United States. These authors acknowledged differences between developed and developing countries in maternal risks from unintended pregnancy and child health outcomes. Generally, in developed countries like the United States and Europe, where contraception and safe abortion are available, health consequences for women and infants are less severe. However, in one US
prospective cohort sample of married women with health insurance, who presented for prenatal care between 1959 and 1966 (n=8823), having an unintended pregnancy was associated with a significantly higher risk of neonatal mortality (Shah et al., 2011). Unintended pregnancy was defined as having one or more of the following attitudes toward the pregnancy: being unhappy, resentful, upset, not wanting the pregnancy, or having a mistimed pregnancy. Women were asked what their husband’s attitudes toward the pregnancy was also, and only women whose husband also viewed the pregnancy as unintended were labeled as having an unintended pregnancy (n=1274, or 14.4% of the sample). Women reporting the pregnancy as unintended in the first trimester of pregnancy were 2.4 times more likely to deliver infants who died in the neonatal period (95% CI= 1.5-4.0). It is important to note that this data was collected between June 1959 and September, 1966, prior to the availability of legal abortion and mostly before legal birth control was available in the US.

Currently, in the United States and other wealthy countries an association exists between unintended pregnancy and an increased risk of low birth weight (odds ratio= 1.36, 95% confidence interval =1.25-1.48, p<0.001), preterm birth (odds ratio=1.33, 95% confidence interval= 0.80-2.21, p<0.01), and being born small for gestational age (odds ratio= 1.31, 95% confidence interval = 1.09-1.58, p<0.01) (Shah, et al., 2011). These findings derive from a meta-analysis of 15 studies, 10 of which were conducted in the US, all of which defined unintended pregnancy as mistimed or unwanted. Another strength of this study was the large overall sample
size (n>109,934), though the entire sample was not used to address each outcome variable.

Children born from an unintended pregnancy also face an increased risk of subsequent child abuse (Gipson et al., 2008, p. 27). In a population based cohort study conducted in the United Kingdom (n=14,256), researchers compared the pregnancy intention of the mother at 12 weeks gestation, to the child’s subsequent risk of being registered with the child protection agency at the age of six. Children under protective supervision were nearly three times more likely to have a mother who reported her pregnancy as unintended at 12 weeks gestation (OR= 2.92; 95% CI= 1.83-4.64). The results of this study suggest an association between UIP and subsequent child abuse, but a limited number of studies have been done to test this association.

Among women in wealthy countries, unintended pregnancy is associated with higher rates of depression and abuse. Cheng et al., (2009) examined Pregnancy Risk Assessment Monitoring System (PRAMS) data from a random sample of women who delivered in Maryland between 2001 and 2006. These authors found a nearly two-fold increase in depression among women with unwanted pregnancies, compared to women with intended pregnancies (Odds ratio=1.98, 95% CI=1.48-2.64). Maxson and Miranda (2011) surveyed 1321 women when they were between 18 and 28 weeks gestation and compared demographic and psychosocial characteristics of women with intended, mistimed, and unwanted pregnancies. Women with unwanted pregnancies tended to be older and have other children. These women also had significantly higher levels of depression, perceived stress and
partners described as critical, controlling, and abusive (p<0.05 for all groups).

Finally, in a study designed to assess the relationship between unintended pregnancy and postpartum depression at three and 12 months, the authors found the lowest rates of depression among women with intended births (5% at three months) compared to unintended births (11% at three months, p<0.001) (Mercier, Garrett, Thorp, & Siega-Riz, 2013). At 12 months, women with intended pregnancies had a postpartum depression rate of 3%, compared to 12% of women with unintended pregnancies (p<0.001). Women with unwanted pregnancies had the highest rates of postpartum depression at three months (15%) and 12 months (20%), and differed significantly from women with mistimed or intended pregnancies. Unfortunately, this report did not compare baseline depression data among women with intended, mistimed, and unwanted pregnancies.

Miller et al., (2010) documented the association between intimate partner violence, reproductive control and unintended pregnancy. Reproductive control was defined as pregnancy coercion (male threatened consequences to the woman if she didn’t get pregnant), and birth control sabotage (refused to use an intact condom, or took birth control pills away). In this sample of 1,278 women recruited from family planning clinics in California, over half of the sample reported having experienced physical or sexual violence from an intimate partner. Pregnancy coercion was reported by nearly 20% of the sample, and birth control sabotage was reported by 15%. Of the women who reported partner violence, 35% also reported pregnancy coercion or birth control sabotage.
Women in poorer countries face far more dangerous health consequences from unintended pregnancy. In low and middle-income countries, preventing unintended pregnancy unequivocally improves the health and survival of women and children (Cleland, Conde-Agudelo, Peterson, Ross, & Tsui, 2012). Ross and Blanc (2012) assert that maternal deaths have declined by 44% in sub-Saharan Africa and Southeast Asia over the previous 20 years because contraception reduced the number of unintended pregnancies, particularly in women of high parity. Maternal morbidity has also declined because contraception increases the interval between pregnancies, as demonstrated by an analysis of 450,000 births in Latin America between 1985 and 1997 (Cleland et al., 2012). Finally, contraception prevents abortion, and in developing countries, where 97% of unsafe abortions occur, women are more likely to die from abortion. Inter-pregnancy spacing of less than 18 months or greater than 60 months leads to poorer infant and child health, as well, more so in developing countries (Cleland et al., 2012, p. 152). Infants have an increased risk of preterm birth (OR=2.3; 95% CI= 2.2-2.4), low birth weight (OR=2.1; 95% CI 2.0-2.3) when born following a short inter-pregnancy interval (<6 mos.). The increased mortality risk does not go away after infancy however. Children born within two years of an elder sibling have 60% increased risk of infant mortality and 40% increased risk of mortality between ages 1-4 (Cleland et al., 2012, pgs. 152-3).

Many of the benefits to women and children of both contraception and safe, legal abortion were realized many years ago in the United States (Cleland, et al., 2012, p. 154). An understanding of the relationship of contraception, legal abortion, unintended pregnancy and pregnancy outcomes is illusive, however, and support for
family planning is waning in the current U.S. political climate. Despite the availability of contraception and safe abortion in the US, rates of unintended pregnancy and abortion remain high compared with other developed countries (Finer & Zolna, 2011).

**Unintended Pregnancy in the US**

In the United States, the rate of unintended pregnancy is estimated to be 49% of all pregnancies, based on data from the NSFG (Finer & Zolna, 2011). Mosher, et al., evaluated trends in rates of unintended pregnancy among women who gave birth between 1982 and 2010, also using NSFG data from 12,279 women (2012). These authors identified demographic factors associated with higher rates of unintended pregnancy: unmarried; African American descent; less education; or, less income. In 2010, as in 1982, approximately 37% of births were from unintended pregnancies. Two changes were noted between the two time-points, however. First, the percentage of births that were intended increased among ever-married, non-Hispanic white women. However, this gain was offset by the dramatic increase in births to unmarried women, which rose from 18% in 1982 to 41% in 2009. Because the proportion of births to unmarried women rose (most of whom have unintended pregnancies) the overall percentage of births that were intended, declined.

Striking disparities in rates of unintended pregnancy exist among different groups of women in the US (Finer & Henshaw, 2006). Women in the following groups had the highest unintended pregnancy rates: women aged 20-24; unmarried women who are co-habitating; women whose income is below the poverty line; women with less than a high school diploma; and black or Hispanic women. Women
who were married at the time of the NSFG survey data collection or were college graduates, reported their pregnancies as intended 72% and 74% of the time, respectively (Finer & Zolna, 2011). By contrast, never married women (who were not cohabitating) reported their intended pregnancy rate as 1%; and formerly married women (who were also not cohabitating) had an intended pregnancy rate of 2.5% (Finer & Zolna, 2011, table 1). The statistical evidence showing disparities in rates of unintended pregnancy suggest that the more socially and financially vulnerable a woman is, the higher her risk for UIP.

Contraceptive use prevents many unintended pregnancies, though certainly not all. Therefore understanding why women do not use contraception and protect themselves from UIP is very important. In a widely cited paper, researchers documented that nearly half of the women who responded to their survey (n=10,683) while waiting for an abortion procedure had not used contraception in the month they became pregnant (Jones, Darroch, & Henshaw, 2002). Women in this sample cited perceived low risk of pregnancy (33% of non-users), and concerns about contraception (32% of non-users) as important reasons why they did not use contraception. Specifically concerns about contraception included problems with contraception in the past and fear of side effects. Twenty-seven percent of non-users of contraception identified unexpected sexual encounters as a reason for non-use of contraception. Finally, these authors also documented that women with incomes lower than 300% of poverty cited financial barriers to obtaining contraception as a reason for non-use.
Following the legalization of contraceptive pills for unmarried women in 1972, many assumed that abortion would become uncommon because women would opt to prevent unwanted pregnancies. Luker noted that the abortion rate in the US had not declined with the legalization of contraceptive pills and she sought to understand why women were not preventing unintended pregnancies (Luker, 1977). Luker’s findings from a sample of 500 women presenting for an abortion at clinics in the San Francisco Bay area (1971-73) remain relevant today. Women weighed the costs and benefits of using contraception (in the present), as well as the costs and benefits of pregnancy (in the future) (Luker, 1977, p. 193). Contraception had (and still has) social costs that family planning clinicians fail to consider. For example, using contraception means a woman is sexually active, and intends to engage in sexual behavior, which is culturally taboo for many young women. Similarly, pregnancy has social benefits that are acquired without formal training or a special selection process. Pregnancy increases a woman’s femininity, her independence and proves that she really is fertile. Pregnancy also tests a partner’s commitment. Finally, as women’s lives change, women continually re-evaluate the costs and benefits of both contraception and pregnancy. In addition to personal costs and benefits, large scale social forces, such as poverty and gender issues, also determine the costs and benefits associated with contraception and pregnancy.

In contrast to the high abortion rates in the US that have persisted to the present day, abortion rates in the Netherlands have declined dramatically over the past three decades and abortion is now a rare event (Levels, Need, Niewenhuis, Sluiter, & Ultee, 2012). In fact, abortion in the Netherlands is rare, despite the fact
that abortion is safe, legal, and freely available to women. Similar to Luker, Levels, et al. posit that women engage in cost-benefit analysis regarding abortion, contraception and pregnancy. Contraceptive cost-benefit analyses includes the ease with which women can obtain very effective forms of contraception: in the Netherlands all forms of contraception are paid for by national insurance, and both pills and long acting reversible contraceptives are readily available. Inexpensive access to a variety of contraceptive methods has reduced the rate of unintended pregnancy and subsequent abortion.

Ayoola, Nettleman, and Brewer (2007) summarized in a literature review reasons why adult women in the US do not use birth control and therefore put themselves at high risk for an unintended pregnancy. These authors reviewed 16 studies that described reasons for non-use of contraception at the individual, intrapersonal, and societal level. At the individual level, women identified several barriers to contraceptive use: fear of side effects of contraception; perceived low risk of pregnancy; the attitude that contraception was unnatural; and embarrassment over purchasing contraception. At the interpersonal level, male partners who disapproved of contraception influenced contraception use. At the societal level, important reasons women did not use contraception were difficulty getting an appointment for contraception and difficulty paying for contraception (Ayoola et al., 2007).

Lifflander, Gaydos, and Hogue (2007) conducted a phenomenological investigation among low-income adult women in Atlanta, Georgia, who had a 24% intended pregnancy rate. One purpose of this study was to explore the meaning and circumstances of planned and unplanned pregnancy. Participants identified positive
and negative situations in which planned pregnancies occur. Planned pregnancies can occur when a couple’s relationship is proceeding well; they are financially secure; they have family and community support; and the couple and their other children are the right age. Planned pregnancies also occur because women are seeking unconditional love from a child, or want to ensure a male partner stays connected. This strategy for securing a relationship was identified as ineffective by participants. Unplanned pregnancies also occurred in differing circumstances, and the circumstances affected whether the woman was happy about the pregnancy and continued the pregnancy. Interestingly, the findings of this study suggest that unintended pregnancies that occur under positive circumstances may be at lower risk than intended pregnancies that occur in less than optimal circumstances (Lifflander et al., 2007, p. 88).

Different use and non-use of contraception among women of differing ethnic and income groups can account for some differences in rates of UIP. (Dehendorf, Rodriguez, Levy, Borrero, & Steinauer, 2010), summarized the research on disparities in family planning outcomes and etiologies, in order to suggest pathways to reducing unintended pregnancy. These authors assert that Black and Hispanic women use less effective methods of contraception overall, and poorer black or Hispanic women are even less likely to use any contraception (Dehendorf, et al., 2010, p. 3). Perhaps this is because safety concerns about contraception are more prevalent among Black and Latina women, no doubt a result of historical events, in which minority women were the unknowing subjects of contraceptive research (Thorburn & Bogart, 2005; Grossman, et al., 2010). Knowledge differences also
exist based on ethnicity and income and may result from lower levels of education, culturally based myths, and attitudes toward contraception in families. Obtaining contraception from health care providers may not be as acceptable to Black or Latina women, who trust peers and family more than health care providers. Finally, Black and Hispanic women report more ambivalence toward pregnancy than White women, and ambivalence toward pregnancy is associated with less use of contraception (Schwartz, Peacock, McRae, Seymour, & Gilliam, 2010; Higgins, Popkin, & Santelli, 2012). But, research has documented that poor and minority women also experience higher rates of method failure and discontinuation, even when using more reliable methods (Jones et al., 2002).

Contraceptive methods vary in their effectiveness and side effect profile, which in turn may cause women to use contraceptives effectively, ineffectively, or quit using them, altogether. For example, long acting reversible contraceptive methods (LARC’s) are considered very effective, and the low rate of use of these in the United States, compared to other countries, is thought to be one factor behind higher rates of UIP in the US (ACOG Committee Opinion, 2009). LARC’s include contraceptive implants (Implanon) and intrauterine devices (IUD’s). LARC’s have the lowest levels of failure rates and the highest continuation rates of all reversible forms of birth control: the failure rate is less than one pregnancy per 100 women in one year (ACOG Committee Opinion, 2009).

The use of LARC’s has been increasing in the United States in the past decade (Kavanaugh, Jerman, Hubacher, Kost, & Finer, 2011). In 2002, less than 1% of women reported using an implant or an IUD for birth control. Between 2006 and
2010, 7.7% of US women report having used an IUD. Kavanaugh et al., report that most of the increase in IUD use has occurred among the youngest and the oldest women of childbearing age, and among women who have given birth (2011).

Effective forms of contraception include Depo-Provera (DMPA) injections, oral contraceptive pills, and combined hormonal patches and rings. In a recent, prospective, large cohort study on the effectiveness of these methods of contraception, Depo-Provera, oral contraceptive pills and combined hormonal patches and rings were found to be substantially less effective than long acting reversible contraceptives, like IUD’s and implants (Winner et al., 2012). If women continue DMPA, and receive repeat injections on time, the failure rate is very low: 0.22 per 100 participants per year. However, only about 60% of women continue DMPA past one year of use. The failure rate of oral contraceptive pills, and combined hormonal patches and rings is approximately 4.55 pregnancies, per 100 participants, per year (Winner et al., 2012).

Contraceptive counseling is widely assumed to be an effective intervention that influences contraceptive use, but in fact there is no evidence to support that assumption. Both a Cochrane Review and the US Preventive Services Task Force have found no evidence supporting the idea that contraceptive counseling improves contraceptive use (Langston, Rosario, & Westhoff, 2010). Additionally, a systematic review and meta-analysis revealed no evidence supporting the hypothesis that components of contraceptive counseling increased contraceptive use following an abortion (Ferreira, Lemos, Figueiroa, & deSouza, 2009).
Whether improved contraceptive knowledge leads to consistent and correct contraceptive use has yet to be determined (Hall, Castaño, Stone, & Westhoff, 2010; Ip, Sin, & Chan, 2009). One recent, large, nationally representative survey of young adults in the US documented the high prevalence of inaccurate knowledge about contraception (Kaye, Suellentrop, & Beck, 2009). Other studies have documented factors besides knowledge that influence contraceptive use, including: belief that one cannot get pregnant; unwanted side effects of contraception; fear of contraception’s health effects; partners or family members who discouraged contraceptive use; and barriers to access because of cost and inconvenience (Ayoola et al., 2007; Grossman, Fernandez, Hopkins, Amastae, & Potter, 2010; Homco et al., 2009).

While evidence does not support a relationship between counseling interventions and increased use of contraception, evidence does show that women who use contraception correctly and consistently are likely to have more education. In 2001 demographic data indicated that women over age 20 with only a high school diploma had U1P rates three times that of college graduates (Finer & Henshaw, 2006, p. 94). More specifically, higher scores on a test about contraceptive methods was associated with an increased likelihood of using hormonal or long acting contraception among young men and young women (Frost, Lindberg, & Finer, 2012). While more education is associated with more effective contraceptive use, no specific educational intervention has been shown to improve contraceptive use. Possibly, a third factor that influences women to have more education in general, and specifically more education about contraception, also influences educated women to use contraception correctly and consistently.
Finally, some authors have studied whether other risky health-related behaviors are associated with unintended pregnancy. Among college women, risk drinking (more than eight drinks per week and binge drinking) was associated with less effective contraceptive use (Ingersoll, Ceperich, Nettleman, & Johnson, 2008). However, in a large sample (n=16,113) of women of childbearing age, women at high risk for unintended pregnancy were less likely to use alcohol and binge drink (Xaverius, Tenkku, & Salas, 2009). Xaverius, et al., also explored whether women at risk for UIP would have fewer other health promotion behaviors, such as: exercise; health screenings, like Pap smear testing and STI counseling; and being obese (2009). Women at high risk for UIP, were 1.23 times more likely to be obese, 1.2 times more likely to smoke, 27% less likely to exercise, 62% less likely to receive a Pap test, and 44% less likely to have received STI counseling.

Other psychosocial characteristics that have been studied in relation to UIP include depression, self-efficacy, perceived stress, social support and coping styles. Maxson and Miranda (2011) found that women with unintended pregnancies have the highest depression scores, highest perceived stress scores, and highest negative paternal support scores, compared to women with mistimed and wanted pregnancies. Women with unwanted pregnancies from Maxson and Miranda’s sample were also more likely to report a previous preterm birth, more likely to report a previous elective abortion, and were less likely to be having their first child. Maxson and Miranda’s findings support Messer, Dole, Kaufman, and Savitz’s, (2005) findings that unintended pregnancies are associated with increased perceived stress, increased rates of depression, and less effective coping strategies. Messer, et al., analyzed the results
of a self-administered mail-back survey, which 1908 pregnant women completed between 24 and 29 weeks gestation. In addition to measuring perceived stress and depression with acceptable scales, these authors assessed maternal coping style with The Ways of Coping Questionnaire. Coping methods included: accept responsibility; confrontative; distancing; escape avoidance; planful problem solving; positive reappraisal; seek social support; and, self-control of behavior. Unintended pregnancies were associated with medium and high levels of depression. Coping styles used by women with UIP included: medium and high levels of accepting responsibility; medium and high levels of escape avoidance; and high levels of positive reappraisal, confrontative, distancing, and self-control coping styles. Interestingly, positive reappraisal indicates an effort to create positive meaning from life events and focus on personal growth. Positive reappraisal is associated with religiosity (Messer et al., 2005).

As mentioned previously, one personal characteristic strongly associated with UIP is age. Young women, specifically women ages 18-24 have the highest rates of UIP (Finer & Zolna, 2011). The ages of 18-24 corresponds directly to the developmental stage newly identified by Arnett as “emerging adulthood” (2000). During emerging adulthood people explore a variety of life directions in love, work, and world-views. Notably, risky behavior of all types peaks during emerging adulthood from a desire for novel and intense experiences (Arnett, 2000, p. 473). People between the years of 18 and 25 no longer see themselves as adolescents, nor do they see themselves entirely as adults. Achieving two criteria mark the transition to full adulthood: accepting responsibility for one’s self; and, making independent
decisions. Parenthood, while not an essential component of adulthood, is a sufficient marker of adult status (Arnett, 2000, p. 473).

Another personal characteristic that may influence risk for UIP is libido, or level of interest in sex. Willoughby (2012) applied the theory of emerging adulthood to his study of emerging adults’ sexual behaviors and attitudes toward sexual activity. Willoughby found four sexual experience groups: confident abstainers; technical abstainers; average engagers; and, high-frequency engagers. Confident abstainers (21.8% of the total sample) disapproved of premarital sex, casual sex and pornography use. Technical abstainers (17% of the total sample) had very low levels of intercourse behavior, but high levels of pornography use and high levels of non-intercourse sexual activity. The average engagers (36.9% of the total sample) were the largest group, and had on average 2.39 lifetime partners. The final group, high frequency engagers (24.3% of the total) had the highest degree of approval for premarital sex, casual sex, and pornography use. This group also engaged in the most sexual activity, and indicated the youngest age at first sex. People in the high engager group experienced sexual activity at rates two to three times higher than the average engagers, and likely also placed themselves at higher risk for STI’s and UIP. Currently, level of interest in sexual activity has not been compared to risk for UIP in the research literature.

**A Brief History of Preventing Unintended Pregnancy: Contraception**

People have engaged in sexual behavior without the intention of conceiving a child since antiquity. In order to prevent pregnancy, people have also practiced contraception. Some ancient contraceptive practices were ineffective or dangerous:
such as drinking lead or mercury, or wearing a weasel testicle around one’s neck. Other ancient contraceptive methods were somewhat or very effective, and are still practiced today. People have known since antiquity that abstinence, outer-course, and exclusive breastfeeding are all reasonably effective forms of contraception. The practice of coitus interruptus is described and condemned in Genesis (Knowles, 2002). African and Native American women of the seventeenth century monitored the quality of their cervical mucus to predict fertility and plan their families (p.4). The oldest known illustration of a condom is 12,000-15,000 years old, and was found painted on a cave wall in France. Similarly, illustrations of condoms occur in 3,000 year old Egyptian artifacts. Archeologists uncovered the oldest surviving condoms in the foundations of Dudley Castle in England; these date to 1640.

Riddle (1997) documented the extensive and effective use of herbal preparations for contraception from ancient times to the present. Greek mythology teaches that Persephone ate only pomegranate seeds while she was kidnapped in the underworld each winter; pomegranate is now known as having contraceptive effects, along with pennyroyal, juniper, and vitex (or chaste-tree). Additionally, pomegranate rind has been used as a diaphragm (Riddle, 1997). The practice of using plants to prevent pregnancy continues in parts of the world to this day. Women in tropical India and Sri Lanka eat a papaya each day to prevent pregnancy. In 1993, an English research team discovered that an enzyme in papayas (papain) interacts with progesterone to prevent pregnancy. The chewed seeds from Queen Anne’s lace has been documented as an effective contraceptive since first recorded by Hippocrates in the fifth century BCE (Riddle, 1992), and this practice continues in rural parts of the
US (Riddle, 1997). Finally, had it not been for Central American women who ate Barbasco root to prevent pregnancy, Russell Marker may not have discovered the inexpensive source of progesterone that Gregory Pincus developed into the first birth control pill (Knowles, 2002). Evidence for the effectiveness of herbal preparations comes from demographic data showing smaller than expected families in many parts of the ancient and medieval world, even after accounting for infant mortality. Further evidence of the effectiveness of herbs also comes from the writings of past scholars who were confident their herbal recipes would prevent pregnancy or cause an early abortion. Finally, current scientific study confirms the antifertility actions of many of the herbs used in ancient and medieval times (Riddle, 1997, p. 67).

Gordon asserts that despite evidence for the use of herbs to prevent pregnancy, the most effective form of contraception from antiquity to the modern age were pessaries, especially those containing oil and rock salt (Gordon, 2002, p. 19). Oil retards sperm motility and rock salt is an effective spermicide. Oil in the vagina has been a recommended form of contraception since the first century BCE, until the early twentieth century, and oils have the additional benefit of providing some protection from sexually transmitted infections. Pessaries were made from a variety of substances, depending on the local resources: herbs; wool; cotton; crocodile dung. The most effective pessaries were sponges, which were only easily available to those who lived by the sea.

Whether contraception was practiced by herbal therapies, pessaries, or some other method, the need to prevent unintended pregnancies and terminate high risk pregnancies has long been recognized in medical texts (Riddle, 1997, pgs. 103-104).
Avicenna, an Islamic writer from 1000 AD, noted that physicians may need to advise contraception and abortion when pregnancy would be too risky because of a woman’s other health problems. William of Saliceto, writing in the thirteenth century, added to Avicenna’s justification for contraception that very young girls who conceived, would likely die during delivery. In the late thirteenth century, one author recommended contraceptive herbs to protect single women’s suitability for later marriage. This is the earliest writer to acknowledge that women’s ability to control their childbearing was linked to their future social status. Later, Malthus, in nineteenth century Britain, wrote extensively on the connection between overpopulation and poverty, leading some social reformers to recommend contraception for the poor to reduce their poverty (Gordon, 2002, p. 40). In the early twentieth century, feminists like Emma Goldman and Margaret Sanger further justified the use of birth control to include the idea that each woman had the right to control her own destiny, which was largely determined by when and how many children a woman delivered (Gordon, 2002, p. 152). This empowered view of women continued through the twentieth century as an additional motivator for finding safe and effective forms of contraception, especially after the Great Depression exposed the economic system as the main cause of poverty, instead of the childbearing habits of the poor as Malthus had insisted (Gordon, 2002, p. 229).

The Integrated Behavioral Model

The integrated behavioral model (IBM) grew out of social cognitive theory, the health belief model, and the theory of reasoned action (Montano & Kasprzyk,
Constructs and proposed relationships contained in IBM are shown in Figure 1 below.

**Figure 1. The Integrated Behavioral Model**

Basically, IBM posits that a small number of variables can explain a substantial proportion of the variance in any behavior in any population (Fishbein, 2008, Yzer, 2012). Additionally, behavior follows from specific attitudes people hold about the behavior. *Attitudes* about the specific behavior are reasonable, but not always rational or even accurate. The best predictor of behavior is a person’s *intention to perform* that behavior. If someone intends to perform a behavior, IBM predicts they will do so, provided they have the necessary *skills and abilities*, and
provided environmental factors do not interrupt their performance of the behavior. A person’s intention to perform the behavior is determined by their attitudes toward the behavior, perceived norms regarding the behavior, and self-efficacy regarding the behavior. In IBM, attitude refers to how favorable or unfavorable a person believes his or her performing the behavior would be. Perceived norm refers to the social pressure one feels to perform the behavior. Social pressure regarding the behavior refers to whether important people value the behavior and whether peers are actually performing the behavior, as well. Finally, self-efficacy consists of an individual’s beliefs about whether they are able to perform the behavior, regardless of their actual competence. Background factors, such as socio-economic status, relationship factors, and education predict attitudes, perceived norms, and self-efficacy.

The Integrated Behavioral Model and Contraceptive Use

The first step in applying IBM to behavioral research, like contraceptive use, is to clearly define the behavior (Fishbein, 2008). The behavior that is the focus of the IBM in this paper is on correct and consistent contraceptive behavior, as a means to prevent UIP. A clear definition of contraceptive behavior is difficult because of the variety of contraceptives available, and the variety of contexts in which sexual behavior occurs. Fishbein (2008) recommends the following: identify the action (use), identify the target (contraception), identify the context (during vaginal intercourse), identify the time (every time). This is the first study to use the integrated behavioral model to explore contraceptive behavior that includes all forms of contraception (Wohlwend et al., 2014).
Attitudes toward contraceptive behavior include the beliefs, knowledge and expected consequences regarding that behavior (Pratte, Whitesell, McFarlane, & Bull, 2010). Research reveals the existence of conflicting attitudes about contraceptive use (Pratte et al., 2010; Ayoola et al., 2007). Attitudes that influence the intention to use contraception include the following: concerns about side effects, concerns about weight gain, and perceived health risks from using contraception (Homco et al., 2009; Ayoola et al., 2007). Many women do not use contraception because they believe they have a low risk of pregnancy, which in some cases means women believe they are infertile (Mosher et al., 2012; Homco, et al., 2009; Jones et al., 2002). Whether or not one deems the health care system that prescribes and dispenses contraception as trustworthy is an attitude that may profoundly influence the intention to use contraception (Yang, Matthews, & Hillemeier, 2011). Many studies have documented inaccurate knowledge about (a) how to use contraception and (b) how contraception works (Kaye et al., 2009; Homco, et al., 2009). Finally, mental health problems are associated with inadequate contraceptive behavior (Homco, et al., 2009; Maxson & Miranda, 2011). While many different attitudes determine one’s intention to use contraceptives, a thorough understanding of which personal benefits and expected consequences affect contraceptive use decisions of women of different ages and socioeconomic strata is not well understood.

Perceived norms consist of the social pressures that one feels to engage in or avoid certain behaviors (Montano & Kasprzyk, 2008, p. 78). Perceived norms are in flux for “emerging adults” defined by Arnett (2000) as a new developmental stage for the years between adolescence and adulthood. Only 13% of young adults perceive
contraception as immoral (Kaye et al., 2009). Additionally, many other ethical questions exist regarding which forms of contraception are unethical and in which circumstances. *Perceived norms* also prescribe an appropriate power balance between partners in intimate relationships. Men who are abusive frequently control their partner’s contraceptive use (Miller et al., 2010). Identifying perceived norms that influence young adults’ contraceptive behavior will enable nurses to develop messages that can be tailored to more effectively influence this aspect of contraceptive behavior.

*Perceived norms* vary depending on socio-economic and community circumstances, also. Higher income women, with more education, are more likely to use contraception consistently and have fewer unintended pregnancies (Finer & Zolna, 2011). Women of color are more likely to experience unintended pregnancy, and the rate of UIP increases among all women of lower socio-economic status. Whether or not perceived norms regarding contraception differ in rural areas compared to urban areas is unknown. Finally, *perceived norms* vary with age, and women ages 18-24 have the highest rate of unintended pregnancy overall (United States Department of Health and Human Services, 2012). The social norms that predict unintended pregnancy among adult women are not well understood.

The third factor that contributes to the intent to use contraception is *self-efficacy*. *Self-efficacy* refers to one’s belief that they can acquire the skills needed to use contraception, and to use contraception in a variety of challenging conditions (Ip et al., 2009). Perceived control over performing a behavior is a component of *self-efficacy*. Perceived control is influenced by how much one believes they can
influence the environment to allow the behavior (Montano & Kasprzyk, 2008). Studies that evaluate self-efficacy and contraceptive use in Western populations are 20-30 years old (Ip et al., 2009). A recent study on the association between self-efficacy and contraceptive knowledge among women in Hong Kong showed no association (Ip et al., 2009). These authors did not evaluate whether self-efficacy was associated with contraceptive intention or use.

Finally, if one intends to use contraception, there are two additional categories of hurdles that may thwart their intentions: environmental constraints and actual competence (Yzer, 2012). Environmental constraints that deter contraceptive use include lack of access to health care clinics, and a lack of money to pay for highly effective forms of birth control. An example of a lack of skills necessary to use contraception may include an inability to adhere to daily pill use, or an inability to manage side effects that are uncomfortable.

In conclusion, more information is needed about the circumstances in which so many American women experience unintended pregnancy. IBM provides a theoretical basis for this investigation that incorporates a comprehensive assessment of factors that influence birth control behavior. Once factors that influence birth control behaviors are better understood, researchers can then develop interventions that are more likely to reduce the rate of unintended pregnancy.
CHAPTER 3

METHODOLOGY

Research Design

This descriptive, cross-sectional study applied the integrated behavioral model to examine the relationship between the behavior of contraceptive use and: (a) attitudes toward contraceptive use; (b) perceived norms regarding contraceptive use; and (c) self-efficacy regarding contraceptive use.

Sample and Setting

This research used a convenience sample of female college students, ages 18-24, a group at high risk for unintended pregnancy.

Setting and population. One community college (College 1) and one public university in central Missouri (College 2) will make up the population. Over 5000 students enroll annually at College 1. Sixty-five percent of College 1 students come from rural areas in central and northeastern Missouri, as of fall 2011, according to the most recent published data (Moberly Area Community College, 2013). Eighty-six percent of the student body is white; 10% are African American; two percent are Hispanic; and two percent identify as another ethnic group. The average age of students at college 1 is 24. Nearly 80% of College 1 students report financial need and 65% report working while they attend school. The average ACT score in fall 2011 of incoming students at College 1 was 19.7, compared to a national average of 21.1.

Over 26,000 undergraduate students enrolled at College 2 for fall semester 2013, according to the most recent published data (University of Missouri, 2013). Over 28% of College 2 students come from other states, while 6.4% come from other countries.
Minority students comprise 15% of the student body at College 2. Twenty-one percent of students receive Pell Grants, identifying them as low-income, and approximately 60% receive other forms of financial aid. The average ACT score of incoming freshman for Fall 2013 was 25.7.

**Sample size.** An overall sample size of 270 was calculated through logistic regression with the following parameters: a power of 0.8, with odds ratio equal to 1.5, and an alpha level equal to 0.05. A minimum of 163 subjects is needed (Faul, et al., 2009). If 163 subjects cannot be obtained, there should be a minimum of 20 cases per predictor variable for logistic regression. For three predictors, at least 60 subjects should be obtained (Leech, Barrett, & Morgan, 2008). Because there are three predictor variables for each dependent variable, at least 120 participants should be included in this research. However, because a factor analysis of the survey will be completed as part of this research, and at least 10 participants are needed per item, the desired sample size is 270 women (Pett, Lackey, & Sullivan, 2003).

**Measures**

Survey questions for Influences on Birth Control Use (IBCU) were derived primarily from two sources: a survey on condom use based on IBM (Pratte et al., 2010) and questions used in *The Fog Zone* (Kaye et al., 2009). The authors of both of these surveys granted permission to use their content with attribution. Please see Appendix G.

Pratte, et al., developed a 37 item instrument designed to measure attitudes (positive outcomes and negative outcomes), norms, and self-efficacy regarding condom use (2010). The authors found survey items from previous literature that were used across multiple studies, and then determined whether those items contained elements of
attitudes, social norms, and self-efficacy. The final instrument was self-administered, took about 20 minutes to complete, and was scored based on a five point Likert Scale. The factor analysis of this scale was based on 3,989 people ages 18-24. Twenty-two items were retained in the final analysis, and the subscales showed a Cronbach’s alpha between 0.76 and 0.89. Survey items for the survey (IBCU) in the proposed study were based on these final items, but modified to reflect birth control methods, not just condom use.

In contrast, *The Fog Zone Survey* was based on survey questions used by the National Survey of Family Growth (Kaye et al., 2009). No factor analysis of the NSFG instrument has been conducted. *The Fog Zone* survey questions used a theoretical model more similar to the Theory of Planned Behavior, and not the integrated behavioral model. Some questions in the survey assessed knowledge with a true/false response format, while others used a Likert scale format.

To validate the survey questions derived from the survey on condom use and the *Fog Zone Survey*, and to ensure readability, a first draft of the survey was presented to four content experts and ten young women. This procedure for instrument development using IBM is recommended by Montano and Krasprzyk (2008). Feedback from pilot study participants and content experts was used to edit the survey to reflect relevant suggestions and address concerns. Participants were able to complete the survey in approximately 20 minutes.

**Theoretical model.** This research is based on the integrated behavioral model (IBM). Basically, IBM posits that a small number of variables can explain a substantial proportion of the variance in any behavior in any population (Fishbein, 2008; Yzer,
Additionally, behavior follows from specific attitudes people hold about the behavior. Attitudes about the specific behavior are reasonable, but not always rational or even accurate. The best predictor of behavior is a person’s intention to perform that behavior. If someone intends to perform a behavior, IBM predicts they will do so, provided they have the necessary skills and abilities, and provided environmental factors do not interrupt their performance of the behavior. A person’s intention to perform the behavior is determined by their attitudes toward the behavior, perceived norms regarding the behavior, and self-efficacy regarding the behavior. In IBM, attitude refers to how favorable or unfavorable a person believes his or her performing the behavior would be. Perceived norm refers to the social pressure one feels to perform the behavior. Social pressure regarding the behavior refers to whether important people value the behavior and whether peers are actually performing the behavior, as well. Finally, self-efficacy consists of an individual’s beliefs about whether they are able to perform the behavior, regardless of their actual competence. Background factors, such as socio-economic status, relationship factors, and education predict attitudes, perceived norms, and self-efficacy. Please see the theoretical model in Figure 1.
**Background questions.** To determine whether a participant is eligible for this study, a series of background questions will be asked: gender; age; and, is the participant planning a pregnancy. Eligible participants will be women between the ages of 18-24, who are not planning a pregnancy. Additional background questions pertain to reproductive and sexual history: is the participant sexually active with men; pregnancy ambivalence; level of engagement in sexual activity; and any previous unintended pregnancies. Participants may choose more than one racial/ethnic identity from the following: American Indian or Alaskan native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White; Hispanic or Latino. Rural residence was determined based on where the participant spent their childhood, based on the US Census Bureau definition of rural and urban (United States Census Bureau, 2013). Socio-
economic status will be determined by asking participants (who are students) whether they work to help pay for college, are a full time student, have health insurance that pays for birth control, and whether their parents help pay for their college.

**Dependent variables.** There are two dependent variables: current contraceptive use, and intended contraceptive use. Current contraceptive use will be measured with two questions: “Last time you had sex (penis in vagina) did you use birth control?” and “When you have sex, do you keep the man’s penis away from your vagina to prevent pregnancy?” Intent to use contraception will be measured with the question “Do you intend to be protected from pregnancy the next time you have sex?” These questions are unique to this survey. Participants will respond to these questions by answering yes/no.

**Independent variables.** There are three independent variables for each of the two dependent variables: intended contraceptive use and reported contraceptive use. Attitudes, perceived norms, and self-efficacy predict intended contraceptive use.

Attitudes toward the behavior of contraceptive use will be measured by eight items: three items are taken from Pratte, et al., (2010); one item is taken from Kaye, et al. (2009); and four items are unique to this survey. Responses to all eight items are in a Likert scale format, with higher scores indicating more agreement with the statement. Face validity on these items was determined by expert review and review by 10 women in the 18-25 age group. Please see Table 3.1: Constructs and their Measures.

Perceived norms will be measured by 13 items: six items are taken from Pratte, et al., (2010); and, seven items are taken from Kaye, et al. (2009). Responses to all 13 items are in a Likert scale format, with higher scores indicating more agreement with the
Self-efficacy will be measured with six items: four items are taken from Pratte, et al., (2010); and two items are unique to this survey. Responses to all six items are in a Likert scale format, with higher scores indicating more agreement with the statement. Face validity on these items was determined by expert review, and review by 10 women in the 18-25 age group.

Competence, environmental factors, and intention predict reported contraceptive use. Please see Figure 1. Competence and environmental factors are measured with statements answered by a five point Likert scale, requiring the participant to choose how much the statement represents their views and experiences. Higher scores on each item indicates more agreement with the statement. Competence is measured with two items: one taken from Kaye, et al. (2009); and one that is unique to this survey. Environmental factors are measured with three items: two are taken from Kaye, et al. (2009); and one is unique to this survey. Table 3.1: Constructs and their Measures, identifies instrument items that measure all dependent and independent variables, and the source of those items.

The survey, Influences on Birth Control Use, is attached in Appendix A.
### Table 3.1

*Constructs and their Measures*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Type of variable</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background variables</strong></td>
<td></td>
<td>1. If yes to have you ever been pregnant, how many pregnancies were a surprise?[^3]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Thinking about the last four weeks, how many times have you had sexual intercourse with a male in the past four weeks?[^4]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. How many males have you had sexual intercourse with in the past 12 months?[^4]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Thinking about your life right now, how important is it to avoid becoming pregnant?[^2]</td>
</tr>
</tbody>
</table>

| Attitude toward Contraceptive Use | Independent      | 1. How likely is it that you would enjoy sex more if you were using birth control?[^3]                                                   |
|                                  |                  | 2. How likely is it that you would be protected from pregnancy if you were using birth control?[^1]                                  |
|                                  |                  | 3. How likely is it that using birth control would be safe for you?[^1]                                                                 |
|                                  |                  | 4. How likely is it that you would feel good if you used birth control?[^3]                                                           |
|                                  |                  | 5. How likely is it that birth control is healthy for you?[^3]                                                                     |
|                                  |                  | 6. How likely is it that using birth control would ruin the sexual mood?[^1]                                                          |
|                                  |                  | 7. How likely is it that using birth control is harmful to you?[^3]                                                                 |
|                                  |                  | 8. Preventing pregnancy with birth control is morally wrong.[^2]                                                                    |

[^1]: Pratte, et al., 2010;  
[^2]: Kaye, Suellentrop, & Sloup, 2009;  
[^3]: Unique to this survey;  
[^4]: National Survey of Family Growth, Section E, 2008
Table 3.1 Continues.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Type of variable</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Norms</td>
<td>Independent</td>
<td>1. How likely is it that your partner would be happier knowing birth control was used in your relationship?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. How likely is it that your partner would be angry if you told him you were using birth control?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. How likely is it that your partner would think you were having sex with another person if you were using birth control?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. How likely is it that your partner would leave you if you said you had to use birth control?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. How likely is it your partner would refuse to have sex if you said you wanted to use birth control?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. In a sexual relationship, the woman decides whether or not to use birth control.(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. In a sexual relationship, the man decides whether or not the woman uses birth control.(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. In a sexual relationship, the man and woman decide together whether or not to use birth control.(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. How important is it that your peers use condoms in one-night flings/stands?(^1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. How important is it that people like you use birth control to prevent pregnancy?(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. How important is it that people like you always have birth control available during the next month?(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. How important is it that people like you plan a pregnancy with a committed partner?(^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. My parents believe I should use birth control to prevent pregnancy.(^2)</td>
</tr>
</tbody>
</table>

\(^1\)Pratte, et al., 2010; \(^2\) Kaye, Suellentrop, & Sloup, 2009; \(^3\)Unique to this survey; \(^4\)National Survey of Family Growth, Section E, 2008
Table 3.1 Continues.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Type of variable</th>
<th>Measure</th>
</tr>
</thead>
</table>
| Self-efficacy            | Independent      | 1. How likely are you to have problems with birth control?  
                           | variable            | birth control? \(^3\)                                                  |
|                          |                   | 2. How confident are you that you could discuss using birth control with your partner? \(^1\) |
|                          |                   | 3. How confident are you that you could suggest using birth control to prevent pregnancy? \(^1\) |
|                          |                   | 4. How confident are you that you could use birth control without having it break the sexual mood? \(^1\) |
|                          |                   | 5. How confident are you that you could use birth control correctly? \(^1\) |
|                          |                   | 6. How confident are you that you could handle any problems with your birth control? \(^3\) |
| Competency               | Independent      | 1. How likely is it that using birth control would be easy for you? \(^3\) |
|                          | variable          | 2. I have used birth control correctly in the past. \(^2\)              |
|                          |                   | 3. I can handle side effects from birth control.                        |
| Environmental           | Independent      | 1. Do you use alcohol or other substances before you have sex? \(^3\) |
| factors                 | variable          | 2. Birth control is affordable for me. \(^2\)                           |
|                          |                   | 3. Birth control is affordable for my peers. \(^2\)                    |
|                          |                   | 4. I can get birth control when I want to. \(^3\)                      |
| Intent to use           | Independent      | 1. Do you intend to be protected from pregnancy the next time you have sex? \(^2\) |
| contraception          | and Dependent    |                                                                        |
| Reported use            | Dependent        | 1. Last time you had sex (penis in vagina) did you use birth control? \(^3\) |
| of contraception       | variable          | 2. When you have sex, do you keep the man’s penis away from your vagina to prevent pregnancy? \(^3\) |

\(^1\) Pratte, et al., 2010; \(^2\) Kaye, Suellentrop, & Sloup, 2009; \(^3\) Unique to this survey; \(^4\) National Survey of Family Growth, Section E, 2008
Data Analysis

Participants completed a paper and pencil survey, then data was entered into Qualtrics Survey Software, and exported to IBM SPSS GradPack v.20 for data analysis. Descriptive statistics were calculated to describe the background variables of participants overall and separately for College 1 and College 2 participants. Factor analysis of the questionnaire was conducted to determine whether items from *Influences on Birth Control Use* reliably measured the independent variables in this research.

To address the **first research question** (what is the relationship between attitudes, perceived norms, and self-efficacy and the intention to use contraception correctly and consistently?), a hierarchical logistic regression analysis was conducted to estimate and examine the relationship between independent variables and dependent variables, while accounting for any possible significant covariates in the model. To address the **second research question** (what is the relationship between intention to use contraception correctly and consistently, competence, and environmental factors and reported contraception behavior?) a hierarchical logistic regression analysis was conducted to estimate and examine the relationship between independent and dependent variables, while accounting for any significant covariates in the model.

ANOVA analyses was conducted to address the **third research question** (Do background variables (age, engagement in sexual activity, previous UIP, pregnancy ambivalence, ethnicity, rural vs. urban, and socio-economic status) contribute to intention to use contraception and reported contraception use over and above the independent variables (attitudes, perceived norms, self-efficacy, competence, and environmental factors). Chi-square tests were used to study the association between background
variables and intention to use contraception and reported contraceptive behavior. Mean responses to the questionnaire were calculated and statistically significant differences in responses were determined based on background data, including: socio-economic status, ethnicity, rural vs. urban residence, pregnancy ambivalence, engagement in sexual activity, previous UIP, campus location, and reported age. Please see the summary of statistical tests and research questions presented in Table 3.2: Analysis Plan for Research Questions.

Table 3.2

Analysis Plan for Research Questions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Independent Variables</th>
<th>Dependent Variable</th>
<th>Analysis Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do the items on IBCU reliably measure the independent variables? Which factors contribute to the most variance in intention to use contraception and reported contraception use?</td>
<td></td>
<td>Intention to use contraception</td>
<td>Exploratory factor analysis and Cronbach’s alpha</td>
</tr>
<tr>
<td>What is the relationship between attitudes, perceived norms, and self-efficacy and the intention to use contraception correctly and consistently?</td>
<td>Attitudes Perceived norms Self-efficacy</td>
<td>Intention to use contraception</td>
<td>Logistic regression</td>
</tr>
</tbody>
</table>
Table 3.2 Continues.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Independent Variables</th>
<th>Dependent Variable</th>
<th>Analysis Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the relationship between intention to use contraception, competence, and environmental factors and reported contraception behavior?</td>
<td>Intent to use contraception, Competence, Environmental factors</td>
<td>Reported contraception behavior</td>
<td>Logistic regression</td>
</tr>
<tr>
<td>What is the relationship between background variables (age, ethnicity, rural vs. urban childhood, engagement in sexual activity, pregnancy ambivalence, previous UIP and socio-economic status) and the independent variables (attitudes, perceived norms, self-efficacy, competence, environmental factors) and Intent to use contraception and reported contraceptive behavior?</td>
<td>Background variables</td>
<td>Attitude, Perceived norms, Self-efficacy, Competence, Environmental factors, Intention to use contraception</td>
<td>ANOVA analysis and Chi-square test, Reported contraceptive behavior</td>
</tr>
</tbody>
</table>
Procedures for Data Collection

To recruit participants at both colleges, the researcher set up a table in a common area. Participants were offered a chance to win one of four iPad Mini’s. Women interested in participating completed the survey on paper. Recruited participants wrote their e-mail address on a ticket stub, and took home the matching ticket stub. The ticket stub number did not reflect any link to the survey the participant completed. Winning participants were contacted by e-mail.

Protection of Human Subjects

Institutional Review Board approval from University of Missouri-Kansas City, Social Sciences and University of Missouri, Columbia, Health Sciences Review Board was obtained prior to beginning data collection. Please see Appendices E and F. The Vice Provost at College 1 approved participation in this research, once IRB approval at University of Missouri, Kansas City (UMKC) was secured. Please see Appendix D.

To protect human subjects, participants read an information page that contained all the elements of informed consent, as the first page of the survey. Please see Appendix B. No identifying information was collected with the survey. After reading the information page, if the woman chose to complete the survey, her consent was implied. Responses by participants were entered into Qualtrics, an encrypted secure site. Paper copies of the surveys were stored in a locked file cabinet and will be shredded once this dissertation is completed.
CHAPTER 4

RESULTS

This chapter details the results of the statistical analysis of the participants’ responses to the survey *Influences on Birth Control Use*. The demographic characteristics of the sample will be presented, and the variables of interest will be described. Finally, the results of the statistical analysis of each of the four research questions will be described.

**Participants’ Characteristics**

Describing the participants’ background characteristics at the two colleges shows that the sampling strategy of using the two colleges broadened the population of college women that was studied. Important differences in background characteristics of participants were identified by using a chi square test to compare the background and demographic characteristics based on the college a participant attended. However, which college a participant attended was not included as a background variable when the research question statistics were calculated.

Of the 270 participants, 268 were between the ages of 18 and 22; one participant was 23, and another was 24 years old. College 1 students had a mean age of 19 (95% CI=18.82-19.18, SD=1.079); 46 (35.9%) were freshmen and 65 (50.8%) participants were sophomores. In comparison, College 2 students had a mean age of 19.9 years (95%CI=19.73-20.09, SD=1.068). Seventy-seven (57.0%) College 2 participants were sophomores, while 20 (14.8%) were juniors. These numbers were statistically different (p<0.001). Overall, 198 (73.3%) women identified their ethnicity as “Caucasian”, while
41 (15.2%) were African American, 6 (2.2%) were Asian, 6 (2.2%) identified as Latino or Hispanic. Sixteen participants (5.9%) identified with more than one ethnic group. At College 1, 102 (75.6%) women identified as Caucasian; 16 (11.9%) participants identified as African American; four (3.0%) identified as Asian; and four (3.0%) identified as Hispanic or Latina. Seven participants at College 1 identified as more than one ethnicity. At College 2, 96 (71.1%) identified as Caucasian; 25 (18.5%) identified as African American; two (1.5%) identified as Asian; and two (1.5%) identified as Hispanic or Latina. Nine (6.7%) participants at College 2 identified as more than one ethnicity. There were no significant differences in ethnicity when compared with a chi square test (p=0.345). There was a significant difference in the hometown locations of participants from the two colleges (p<0.001). At College 1, 42 (31.6%) participants were from a rural area, while at College 2, only 13 (9.7%) were from a rural area.

For the variable “having expenses paid by parents”, a proxy for economic support, 62 (47.3%) participants at College 1 reported that their parents paid none of their college expenses, while 32 (24.4%) reported their parents paid less than one-third. Among College 2 participants, 22 (26.2%) reported their parents paid none of their college expenses and 26 (19.3%) reported less than one-third of their college expenses were paid. These differences were statistically significant (p<0.001). A second indicator of economic support was that the majority (94/70.7%) of College 1 participants reported working while in school; fewer College 2 participants reported working while in school, (69/53.9%). These differences too were statistically significant (p=0.004). A final source of economic support, health insurance that paid for birth control, was reported by 80 (66.1%) of College 1 participants and by 113 (85.6%) of College 2 participants. This
difference was statistically significant (p<0.001). Please see Table 4.1: Characteristics of Sample.

There were statistically significant differences in sexual activity and pregnancy prevention reports between College 1 and College 2. Among College 1 participants, 70 (52.6%) reported they were currently sexually active with men, and 91 (67.4%) College 2 participants reported they were currently sexually active with men. These numbers were statistically different (p=0.009). Ninety-one (67.9%) participants from College 1 reported contraceptive use, while 105 (77.8%) participants from College 2 reported contraceptive use. These numbers were statistically different (p=0.046).

Many characteristics were not statistically significantly different between the participants at the two colleges. At College 1, 120 participants (44.9%) intended to use contraception the next time they had sex; and at College 2, 129 (48.3%) intended use. There was no statistically significant difference in these numbers (p=0.102). Of the 18 women who did not intend to be protected from pregnancy, some wrote comments on the survey indicating they were not sexually active, so there was no need to be protected from pregnancy.

There was no difference between the two colleges in the number of male partners reported in the previous 12 months. Overall, 92 (34.2%) women reported no male partner; 107 (39.8%) women reported one male partner; 47 (17.5%) reported two or three male partners; and 23 (8.5%) reported four or more male partners. There was no difference in the number of participants that reported they were in a committed relationship with a man (N=112, 41.5%). Finally, 93.3% of participants agreed that
preventing pregnancy right now was important, or very important, but there was a statistically significant difference between the two colleges.

Table 4.1

*Characteristics of Sample*

<table>
<thead>
<tr>
<th>Variable—Sample</th>
<th>Sample N/%</th>
<th>College 1 N/%</th>
<th>College 2 N/%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Age- 18</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>71/26.3%</td>
<td>50 (37.0%)</td>
<td>21 (15.6%)</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>66/24.4%</td>
<td>52 (38.5%)</td>
<td>14 (10.4%)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>85/31.5%</td>
<td>23 (17.0%)</td>
<td>62 (45.9%)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>38/14.1%</td>
<td>6 (4.4%)</td>
<td>32 (23.7%)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>8/3.0%</td>
<td>2 (1.5%)</td>
<td>6 (4.4%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Ethnicity or Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian/Alaskan</td>
<td>2 (0.7%)</td>
<td>2 (1.5%)</td>
<td>0 (&lt;1%)</td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>6 (2.2%)</td>
<td>4 (3.0%)</td>
<td>2 (1.5%)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td>41 (15.2%)</td>
<td>16 (11.9%)</td>
<td>25 (18.5%)</td>
<td>0.345</td>
</tr>
<tr>
<td>Hawaiian/Pacific</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islander</td>
<td>1 (0.4%)</td>
<td>0</td>
<td>1 (0.7%)</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>198 (73.3%)</td>
<td>102 (75.6%)</td>
<td>96 (71.1%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td></td>
<td>6 (2.2%)</td>
<td>4 (3.0%)</td>
<td>2 (1.5%)</td>
</tr>
<tr>
<td>More than one group</td>
<td>16 (5.9%)</td>
<td>7 (5.2%)</td>
<td>9 (6.7%)</td>
<td></td>
</tr>
<tr>
<td><em>Working—</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>163 (60.4%)</td>
<td>94 (70.7%)</td>
<td>69 (53.9%)</td>
<td>.004</td>
</tr>
<tr>
<td>No</td>
<td>98 (37.5%)</td>
<td>39 (29.3%)</td>
<td>59 (46.1%)</td>
<td></td>
</tr>
<tr>
<td><em>Health Insurance for birth control</em></td>
<td>Yes- 193 (71.5%)</td>
<td>Yes- 80 (66.1%)</td>
<td>Yes- 113 (85.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>No- 60 (22.2%)</td>
<td>No- 41 (33.9%)</td>
<td>No- 19 (14.4%)</td>
<td></td>
</tr>
<tr>
<td><em>Rural Childhood—</em></td>
<td>Yes</td>
<td>55 (20.4%)</td>
<td>42 (31.6%)</td>
<td>13 (9.7%)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; difference between the two colleges is statistically significant.
Table 4.1 Continues.

<table>
<thead>
<tr>
<th>Variable—Sample Total</th>
<th>Sample N/%</th>
<th>College 1 N/%</th>
<th>College 2 N/%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Committed Relationship with a man</td>
<td>Yes=112 (41.5%)</td>
<td>Yes- 56 (41.8%)</td>
<td>Yes- 56 (42.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No=155 (58.1%)</td>
<td>No-78 (58.2%)</td>
<td>No-77 (57.9%)</td>
<td></td>
</tr>
<tr>
<td>Time in Relationship:</td>
<td></td>
<td></td>
<td></td>
<td>P=0.529</td>
</tr>
<tr>
<td>&lt;4mos……18 (16.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1year …..29 (26.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥1year .....63 (57.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Currently Sexually Active</td>
<td>Yes- 161 (59.6%)</td>
<td>Yes- 70 (52.6%)</td>
<td>Yes- 91 (67.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No-107 (39.6%)</td>
<td>No-63 (47.4%)</td>
<td>No-44 (32.6%)</td>
<td>P=0.009</td>
</tr>
<tr>
<td>Number of male partners past 12 mos.</td>
<td></td>
<td></td>
<td></td>
<td>P=0.066</td>
</tr>
<tr>
<td>None</td>
<td>92 (34.2%)</td>
<td>52 (19.3%)</td>
<td>40 (14.9%)</td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>107 (39.8%)</td>
<td>55 (20.4%)</td>
<td>52 (19.3%)</td>
<td></td>
</tr>
<tr>
<td>Two or Three</td>
<td>47 (17.5%)</td>
<td>19 (7.0%)</td>
<td>28 (10.4%)</td>
<td></td>
</tr>
<tr>
<td>Four or more</td>
<td>23 (8.5%)</td>
<td>8 (3.0%)</td>
<td>15 (5.6%)</td>
<td></td>
</tr>
<tr>
<td>*Sexual Intercourse previous 4 weeks</td>
<td></td>
<td></td>
<td></td>
<td>P=0.039</td>
</tr>
<tr>
<td>0</td>
<td>91 (34.1%)</td>
<td>37 (27.8%)</td>
<td>54 (40.3%)</td>
<td></td>
</tr>
<tr>
<td>3 or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; difference between the two colleges is statistically significant.
Table 4.1 Continues

<table>
<thead>
<tr>
<th>Variable—Sample Total</th>
<th>Sample N/%</th>
<th>College 1 N/%</th>
<th>College 2 N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intends to use</strong> (BC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes…</td>
<td>249 (92.2%)</td>
<td>120 (44.9%)</td>
<td>129 (48.3%)</td>
</tr>
<tr>
<td>No…</td>
<td>18 (6.7%)</td>
<td>12 (4.5%)</td>
<td>6 (2.2%)</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td></td>
<td></td>
<td>.102</td>
</tr>
<tr>
<td><em>Uses BC</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes-</td>
<td>196 (72.6%)</td>
<td>Yes- 91 (67.9%)</td>
<td>Yes- 105 (77.8%)</td>
</tr>
<tr>
<td>No-</td>
<td>73 (27.0%)</td>
<td>No- 43 (32.1%)</td>
<td>No- 30 (22.2%)</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td></td>
<td></td>
<td>=0.0</td>
</tr>
</tbody>
</table>

| BC Use is Immoral     |            |              |              |
| Definitely false-      | 194 (71.9%) | 90 (33.7%)   | 104 (39.0%)  |
| False-                |            |              |              |
| Probably false-        | 31 (11.5%)  | 16 (6.0%)    | 15 (5.6%)    |
| Not sure-             | 15 (5.6%)   | 10 (3.7%)    | 5 (5.6%)     |
| Probably true-        | 16 (5.9%)   | 9 (3.4%)     | 7 (2.6%)     |
| Definitely true-      | 11 (4.1%)   | 8 (3.0%)     | 3 (1.1%)     |
| **P**                 |            |              | =0.2         |

*p<0.05; difference between the two colleges is statistically significant.*
Table 4.1 Continues.

<table>
<thead>
<tr>
<th>Variable—Sample Total</th>
<th>Sample N/%</th>
<th>College 1 N/%</th>
<th>College 2 N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Avoiding pregnancy (ambivalence)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all important</td>
<td>4 (1.5%)</td>
<td>3 (1.1%)</td>
<td>1 (0.4%)</td>
</tr>
<tr>
<td>Not too important</td>
<td>4 (1.5%)</td>
<td>3 (1.1%)</td>
<td>1 (0.4%)</td>
</tr>
<tr>
<td>Not Sure</td>
<td>13 (4.8%)</td>
<td>11 (4.1%)</td>
<td>2 (0.7%)</td>
</tr>
<tr>
<td>Very Important</td>
<td>20 (7.4%)</td>
<td>13 (4.8%)</td>
<td>7 (2.6%)</td>
</tr>
<tr>
<td>Extremely Important</td>
<td>229 (84.8%)</td>
<td>105 (38.9%)</td>
<td>124 (45.9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Pregnancies</th>
<th>None</th>
<th>One</th>
<th>Two or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>None-256 (94.8%)</td>
<td>123 (46.1%)</td>
<td>133 (49.8%)</td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>8 (6.1%)</td>
<td>2 (0.7%)</td>
<td></td>
</tr>
<tr>
<td>Two or more</td>
<td>1 (0.4%)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05; difference between the two colleges is statistically significant.
Research Question One: Do the items on IBCU reliably measure the independent variables?

Principal factor analysis with oblique rotation was conducted to assess the underlying structure of the variables in the *Influences on Birth Control Use Scale*. The assumption of independent sampling was met. The Kaiser-Meyer Olkin measure of sampling adequacy was 0.862, indicating sufficient items for each factor. The Bartlett’s test of sphericity was significant (<0.001), indicating the correlations between the items were high enough to warrant a factor analysis. Five factors were requested to reflect the five theoretical factors:

- Attitudes toward contraceptive use,
- Social norms about contraceptive use,
- Perceived control over contraceptive use,
- Competency around contraceptive use, and
- Environmental factors regarding birth control use.

The initial factor analysis with oblique rotation showed eight factors with eigenvalues above 1.0. Therefore, the scree plot was examined, which showed a flattening of the line at four factors. Please see Figure 2. Because five factors were in the theoretical model (integrated behavioral model) the fourth and fifth factors were included in the data reduction process, whereas the sixth through eighth factors were not.
Figure 2. Scree Plot of Factor Analysis
Table 4.2

*Exploratory Factor Analysis of IBCU*

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>Self-efficacy</th>
<th>Perceived Norms</th>
<th>Competency</th>
<th>Environmental factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner happier knowing contraception used.¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enjoy sex more</strong>³</td>
<td>0.817</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Important that others use contraception²</td>
<td>0.717</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel good using contraception³</td>
<td>0.682</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easy to use contraception³</td>
<td>0.612</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe to use contraception¹</td>
<td>0.551</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Important to have contraception available.²</td>
<td>0.520</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contraception prevents pregnancy¹</td>
<td>0.517</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source of questions:
¹Pratte, et al, 2010;
²Kaye, Suellentrop, & Sloup, 2009;
³Unique to this survey;
⁴National Survey of Family Growth, Section E, 2008
Table 4.2 Continues.

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>Self-efficacy</th>
<th>Perceived Norms</th>
<th>Competency</th>
<th>Environmental factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Efficacy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contraception preserves sexual mood(^1)</td>
<td></td>
<td>0.954</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can use contraception correctly(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can suggest condom use?(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can discuss contraception(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can handle problems with contraception(^3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can suggest contraception(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived norms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner leave(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.845</td>
</tr>
<tr>
<td>Partner think cheating(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.756</td>
</tr>
<tr>
<td>Contraception ruins sexual mood(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.738</td>
</tr>
<tr>
<td>Partner refuse sex(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.718</td>
</tr>
<tr>
<td>Partner angry(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.706</td>
</tr>
</tbody>
</table>

Source of questions:
\(^1\)Pratte, et al, 2010;
\(^2\)Kaye, Suellentrop, & Sloup, 2009;
\(^3\)Unique to this survey;
\(^4\)National Survey of Family Growth, Section E, 2008
Table 4.2 Continues.

<table>
<thead>
<tr>
<th>Item</th>
<th>Attitude</th>
<th>Self-efficacy</th>
<th>Perceived Norms</th>
<th>Competency</th>
<th>Environmental factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contraception problems likely</td>
<td></td>
<td></td>
<td></td>
<td>-0.897</td>
<td></td>
</tr>
<tr>
<td>Contraception likely harmful</td>
<td></td>
<td></td>
<td></td>
<td>-0.831</td>
<td></td>
</tr>
<tr>
<td>Contraception likely healthy</td>
<td></td>
<td></td>
<td></td>
<td>0.526</td>
<td></td>
</tr>
<tr>
<td>Environmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contraception affordable for me</td>
<td></td>
<td></td>
<td></td>
<td>0.809</td>
<td></td>
</tr>
<tr>
<td>Contraception affordable peers</td>
<td></td>
<td></td>
<td></td>
<td>0.735</td>
<td></td>
</tr>
</tbody>
</table>

Source of questions:
1 Pratte, et al, 2010;
2 Kaye, Suellentrop, & Sloup, 2009;
3 Unique to this survey;
4 National Survey of Family Growth, Section E, 2008

The first factor, attitude, measured positive outcomes from contraceptive use, and had strong loadings on the first eight items. The second factor measured self-efficacy, and had strong loadings on the next six items in Table 4.2. The third factor measured perceived norms, and had strong loadings on the next five items. The fourth factor, measured competency with contraception, and had strong loadings on the next three items. The fifth factor, environmental factors, which measured cost for self and others, had strong loadings on the last two items.
Composition of the Scales

Participants chose the score to each item on IBCU by selecting an answer that corresponded to between one and five on a Likert scale. Scores were then added on all items within each scale. While this data represents an ordinal level of measurement, it is common practice in social sciences to treat Likert scale measurement as interval data. The rationale for this practice comes from the observation that attribute-type independent variables exist on a continuum, rather than in discrete categories, therefore researchers can analyze attribute measurements from Likert scales using parametric statistics (Nunnally & Bernstein, 1994).

To assess whether adding together the eight items of the first factor, attitude, formed a reliable scale with the current sample, Cronbach’s alpha was computed. The alpha for the eight items was 0.867, indicating a scale with good internal consistency and reliability. The range of total possible scores (from adding all eight items together) on this scale was 8-40 points; a higher score indicated a more positive attitude toward contraception. The mean score on the attitude scale was 34.7, which is negatively skewed. The median score for the attitude scale is 37, and the mode is 40. Complete data was obtained from 258 participants on the attitude scale.

The perceived norms scale consisted of five items. The Cronbach’s alpha for these five items was 0.829, indicating a scale with good internal consistency and reliability. The range of possible scores on this scale was 6-30 points; a lower score indicated perceived norms that are more favorable toward contraception. The mean score on the perceived norms scale was 6.5, the median was 5.0, and the mode was 5.0. The
results on this scale are positively skewed. Complete data was obtained from 264 participants on the perceived norms scale.

The self-efficacy scale consisted of six items. The Cronbach’s alpha for these six items was 0.835 indicating a scale with good internal consistency and reliability. The range of possible scores on this scale was 6-30 points; a higher score indicates more self-efficacy regarding contraception. The mean of the self-efficacy scale was 27.3, while the median was 29 and the mode was 30. These results are negatively skewed. Complete data was obtained from 264 participants on the self-efficacy scale.

The competency scale had only three items. The Cronbach’s alpha for these three items was 0.809, indicating a scale with good internal consistency and reliability. The range of possible scores on this scale was 5-15 points; a higher score indicated more competency with contraception. The mean score on the competency scale was 12.2, the median was 13, and the mode was 15. The results are negatively skewed. Only 179 participants completed the data for the competency scale.

The environmental factors scale had only two items: birth control is affordable for me; and birth control is affordable for my peers. The range of possible scores on this scale was 2-10 points; a higher score indicates an environment that is more supportive of contraceptive use. The mean score for environmental factors was 8.1, the median was eight, and the mode was eight. Complete data was obtained on the environmental factors from 268 participants.

The dependent variable, “use contraception” was scored as a yes, if a participant answered any of the following three questions affirmatively: Last time you had sex did you use birth control; when you have sex do you keep the man’s penis away from your
vagina to prevent pregnancy; and, last time you had sex, did you use a condom? Many participants used more than one form of contraception. Birth control was used by 152 participants (67.3%); ejaculation outside of the vagina was used by 57 (25.3%) participants; and, condoms were used by 116 (53.5%) participants. Please see Table 4.3: Scores on Dependent and Independent Variables of Interest.

Table 4.3

Scores on Dependent and Independent Variables of Interest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
<th>Entire Sample</th>
<th>College 1 Mean</th>
<th>College 2 Mean</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>Attitude Scale</td>
<td>Mean: 34.7</td>
<td>Mean: 33.3</td>
<td>Mean: 36.6</td>
<td><strong>P=0.003</strong>*</td>
</tr>
<tr>
<td></td>
<td>Eight items</td>
<td>Median: 37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mode: 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Std. Dev.: 6.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range: 29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Norms</td>
<td>Mean: 6.5</td>
<td>Mean: 7.4</td>
<td></td>
<td></td>
<td><strong>P=0.000</strong>*</td>
</tr>
<tr>
<td></td>
<td>Median: 5.0</td>
<td>Mean: 5.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode: 5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range: 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>Mean: 27.3</td>
<td>Mean: 26.8</td>
<td></td>
<td></td>
<td>P=0.909</td>
</tr>
<tr>
<td></td>
<td>Median: 29</td>
<td>Mean: 27.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode: 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 27.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range: 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>Mean: 8.1</td>
<td>Mean: 8.0</td>
<td></td>
<td></td>
<td>P=0.906</td>
</tr>
<tr>
<td></td>
<td>Median: 8</td>
<td>Mean: 8.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode: 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 1.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range: 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant difference between the two colleges.
Table 4.3 Continues.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale</th>
<th>Entire Sample</th>
<th>College 1 Mean</th>
<th>College 2 Mean</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>Competency</td>
<td>Mean: 12.2</td>
<td>Mean: 12.1</td>
<td>Mean: 12.4</td>
<td>P=0.859</td>
</tr>
<tr>
<td></td>
<td>Median: 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode: 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. Dev.: 3.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range: 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent</td>
<td>Intention to use BC</td>
<td>Yes- 249 (93.3%)</td>
<td>Yes- 120 (44.9%)</td>
<td>Yes- 129 (48.3%)</td>
<td>P=0.102</td>
</tr>
<tr>
<td></td>
<td>No- 18 (6.7%)</td>
<td>No- 12 (4.5%)</td>
<td>No- 6 (2.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use BC</td>
<td>Yes- 196 (72.9%)</td>
<td>Yes- 91 (33.8%)</td>
<td>Yes- 105 (39.0%)</td>
<td></td>
<td>P=0.046*</td>
</tr>
<tr>
<td></td>
<td>No- 73 (27.1%)</td>
<td>No- 43 (16.0%)</td>
<td>No- 30 (11.2%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant difference between the two colleges.

Research Question Two: What is the Relationship between Background Variables, Independent Variables and Dependent Variables?

Research question two asks whether the background variables of:

- Age,
- Ethnicity
- Rural childhood,
- Currently sexually active,
- Number of male partners,
- Intercourse (amount in past four weeks),
- Pregnancy prevention,
- Work,
- Health insurance for contraception,
And, expenses for college paid,

Were associated with the independent variables of:

- Attitudes
- Norms
- Self-efficacy
- Competency
- And, environmental factors.

And, were the background factors described above associated with the dependent variables:

- Intention to use contraception,
- And use of contraception.

ANOVA was conducted to determine whether attitudes, perceived norms, self-efficacy, competency and environmental factors changed significantly based on the background variables. The background variables were: age; ethnicity; rural childhood; currently sexually active; previous pregnancy; number of male partners; intercourse in past four weeks; work; health insurance; and expenses for college paid. Which college the participant attended was not included as a background variable because different colleges were chosen in order to increase the diversity of background factors among participants. Findings are listed in Table 4.4.
Table 4.4

*Results: ANOVA test of Background and Independent Variables (Mean and p value).*

<table>
<thead>
<tr>
<th>Background Variable</th>
<th>Attitude toward contraceptive use</th>
<th>Self-efficacy regarding contraceptive use</th>
<th>Perceived norms toward contraceptive use</th>
<th>Competency with contraceptive use</th>
<th>Environmental factors support contraceptive use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>34.4</td>
<td>26.4</td>
<td>6.9</td>
<td>12.3</td>
<td>8.2</td>
</tr>
<tr>
<td>19</td>
<td>34.3</td>
<td>27.6</td>
<td>6.7</td>
<td>13.1</td>
<td>8.1</td>
</tr>
<tr>
<td>20</td>
<td>35.8</td>
<td>27.8</td>
<td>6.0</td>
<td>11.9</td>
<td>8.0</td>
</tr>
<tr>
<td>21</td>
<td>34.3</td>
<td>27.5</td>
<td>6.0</td>
<td>12.0</td>
<td>8.1</td>
</tr>
<tr>
<td>22</td>
<td>29.6</td>
<td>25.0</td>
<td>8.8</td>
<td>10.6</td>
<td>7.4</td>
</tr>
<tr>
<td>23</td>
<td>0</td>
<td>30.0</td>
<td>5.0</td>
<td>7.0</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>32.0</td>
<td>30.0</td>
<td>7.0</td>
<td>4.0</td>
<td>0</td>
</tr>
<tr>
<td>p=0.116</td>
<td>p=0.097</td>
<td>p=0.098</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>31.5</td>
<td>25.0</td>
<td>7.0</td>
<td>4.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Asian</td>
<td>37.2</td>
<td>25.8</td>
<td>7.2</td>
<td>14.3</td>
<td>7.7</td>
</tr>
<tr>
<td>African American</td>
<td>34.9</td>
<td>28.2</td>
<td>6.3</td>
<td>11.9</td>
<td>8.0</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td>37.0</td>
<td>30.0</td>
<td>5.0</td>
<td>12.2</td>
<td>8.0</td>
</tr>
<tr>
<td>White</td>
<td>34.4</td>
<td>27.1</td>
<td>6.4</td>
<td>12.2</td>
<td>8.0</td>
</tr>
<tr>
<td>Latina</td>
<td>36.5</td>
<td>27.2</td>
<td>7.2</td>
<td>13.5</td>
<td>8.2</td>
</tr>
<tr>
<td>More than one</td>
<td>36.1</td>
<td>28.0</td>
<td>7.1</td>
<td>13.2</td>
<td>7.8</td>
</tr>
<tr>
<td>(p=0.753)</td>
<td>(p=0.398)</td>
<td>(p=0.930)</td>
<td>(p=0.057)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, a significant association.*
### Table 4.4 Continues.

<table>
<thead>
<tr>
<th>Background Variable</th>
<th>Attitude toward contraceptive use</th>
<th>Self-efficacy regarding contraceptive use</th>
<th>Perceived norms toward contraceptive use</th>
<th>Competency with contraceptive use</th>
<th>Environmental factors support contraceptive use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Insurance</td>
<td>yes—35.7</td>
<td>yes—27.6</td>
<td>yes—6.4</td>
<td>yes—12.5</td>
<td>yes—8.4</td>
</tr>
<tr>
<td></td>
<td>no—33.3</td>
<td>no—26.8</td>
<td>no—6.3</td>
<td>no—11.7</td>
<td>no—7.2</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.004</strong></td>
<td><strong>p=0.080</strong></td>
<td><strong>p=0.719</strong></td>
<td></td>
<td><strong>p&lt;0.001</strong></td>
</tr>
<tr>
<td>Current Sex Act.</td>
<td>yes—35.9</td>
<td>yes—28.1</td>
<td>yes—6.0</td>
<td>yes—12.3</td>
<td>yes—8.2</td>
</tr>
<tr>
<td></td>
<td>no—32.6</td>
<td>no—25.8</td>
<td>no—7.1</td>
<td>no—12.1</td>
<td>no—7.8</td>
</tr>
<tr>
<td></td>
<td><strong>p&lt;0.001</strong></td>
<td><strong>p&lt;0.001</strong></td>
<td><strong>p=0.001</strong></td>
<td></td>
<td><strong>p=0.074</strong></td>
</tr>
<tr>
<td>Ever pregnant</td>
<td>none—34.7</td>
<td>none—27.2</td>
<td>none—6.5</td>
<td>none—12.3</td>
<td>none—8.1</td>
</tr>
<tr>
<td></td>
<td>once—35.8</td>
<td>once—28.0</td>
<td>once—6.9</td>
<td>once—8.5</td>
<td>once—7.6</td>
</tr>
<tr>
<td></td>
<td>twice or &gt;—37.0</td>
<td>twice or &gt;—30.0</td>
<td>twice or &gt;—9.0</td>
<td>twice or &gt;—0</td>
<td>twice or &gt;—8.0</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.811</strong></td>
<td><strong>p=0.607</strong></td>
<td><strong>p=0.598</strong></td>
<td></td>
<td><strong>p=0.003</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>p=0.678</strong></td>
</tr>
<tr>
<td>Episodes of sex in the past four weeks</td>
<td>0—33.3</td>
<td>0—26.6</td>
<td>0—6.8</td>
<td>0—3.3</td>
<td>0—8.0</td>
</tr>
<tr>
<td></td>
<td>1—34.1</td>
<td>1—27.1</td>
<td>1—6.4</td>
<td>1—2.5</td>
<td>1—8.1</td>
</tr>
<tr>
<td></td>
<td>2—37.0</td>
<td>2—27.4</td>
<td>2—5.8</td>
<td>2—3.6</td>
<td>2—8.1</td>
</tr>
<tr>
<td></td>
<td>3+—36.2</td>
<td>3+—28.3</td>
<td>3+—6.2</td>
<td>3+—2.8</td>
<td>3+—8.2</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.001</strong></td>
<td><strong>p=0.005</strong></td>
<td><strong>p=0.215</strong></td>
<td></td>
<td><strong>p=0.760</strong></td>
</tr>
<tr>
<td>Number of partners in the past 12 months</td>
<td>0—32.4</td>
<td>0—25.9</td>
<td>0—7.0</td>
<td>0—12.1</td>
<td>0—7.7</td>
</tr>
<tr>
<td></td>
<td>1—35.8</td>
<td>1—28.2</td>
<td>1—6.2</td>
<td>1—12.2</td>
<td>1—8.1</td>
</tr>
<tr>
<td></td>
<td>2—34.5</td>
<td>2—27.9</td>
<td>2—5.7</td>
<td>2—11.8</td>
<td>2—8.1</td>
</tr>
<tr>
<td></td>
<td>3—37.6</td>
<td>3—28.1</td>
<td>3—5.7</td>
<td>3—13.4</td>
<td>3—9.0</td>
</tr>
<tr>
<td></td>
<td>4—33.8</td>
<td>4—25.9</td>
<td>4—7.1</td>
<td>4—11.8</td>
<td>4—8.3</td>
</tr>
<tr>
<td></td>
<td>5+—35.2</td>
<td>5+—27.4</td>
<td>5+—8.3</td>
<td>5+—12.3</td>
<td>5+—8.4</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.001</strong></td>
<td><strong>p&lt;0.001</strong></td>
<td><strong>p=0.031</strong></td>
<td></td>
<td><strong>p=0.044</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>p=0.734</strong></td>
</tr>
</tbody>
</table>

*<i>p<0.05, a significant association</i>*

Participants who were 18 and 19 years old reported higher scores on the competency scale than older participants. Higher scores represent increased competency.

Participants with health insurance reported more favorable attitudes toward birth control use, than those without health insurance (**p=0.004**). Participants who were currently sexually active reported more favorable attitudes toward birth control use (**p<0.001**),
improved self-efficacy regarding birth control use (p<0.001), and more favorable perceived norms regarding birth control use (p=0.001) than participants who were not sexually active currently. Participants who reported at least one pregnancy reported lower scores on the competency scale with birth control use than women who reported no pregnancies (p=0.003).

The amount of sexual activity a respondent engaged in was associated with significant changes in attitudes, perceived norms, self-efficacy, competency, and environmental factors. Participants who reported no sexual intercourse in the past four weeks had less favorable attitudes toward birth control use than women who reported one episode of sexual intercourse; in turn, women with one episode of sexual intercourse reported less favorable attitudes toward birth control use than women who reported two episodes of sexual intercourse. Participants who reported two or more episodes of sexual intercourse had the most favorable attitudes toward birth control use (p=0.001) and reported more favorable environmental factors (decreased cost) (p=0.002). Finally, women with one or more sexual partners in the past twelve months had more favorable perceived norms (p=0.021), and fewer environmental impediments to contraceptive use (p=0.003).

Chi square tests were calculated to determine the relationship between background variables and the dependent variables: intent to use contraception and reported contraceptive use. Findings are listed in Table 4.5. The more college expense parents paid for, the more likely participants were to report they intended to use contraception (p=0.008). Participants from a rural area were less likely to report they intended to use contraception than participants from an urban area (p=0.006). As age
increased, the number of participants who reported contraceptive use increased (p=0.049). Similarly, health insurance that paid for contraception (p<0.001) and being sexually active (p<0.001) were both associated with higher rates of reported contraceptive use. Participants who reported alcohol use with sexual activity were more likely to also report contraceptive use (p=0.030). Finally, participants in a committed relationship (p<0.001), participants reporting more sexual activity in the past four weeks (p<0.001), and participants reporting one or more male partners (p<0.001) were all more likely to report contraceptive use.

Table 4.5

*Results: Chi Square test of Background and Dependent Variables (p value)*

<table>
<thead>
<tr>
<th>Background</th>
<th>Intends Contraception</th>
<th>Use Contraception</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>67 (25.1%)</td>
<td>45 (24.5%)</td>
</tr>
<tr>
<td>19</td>
<td>60 (24.1%)</td>
<td>48 (24.5%)</td>
</tr>
<tr>
<td>20</td>
<td>79 (31.7%)</td>
<td>72 (36.7%)</td>
</tr>
<tr>
<td>21</td>
<td>35 (14.1%)</td>
<td>25 (12.8%)</td>
</tr>
<tr>
<td>22 or older</td>
<td>8 (3.2%)</td>
<td>6 (3.0%)</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.95</strong></td>
<td><strong>P=0.049</strong>*</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>2 (0.8%)</td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Indian/Alaskan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td>6 (2.4%)</td>
<td>3 (1.5%)</td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>38 (15.3%)</td>
<td>30 (15.3%)</td>
</tr>
<tr>
<td>Hawaiian/Pacific</td>
<td>1 (0.4%)</td>
<td>1 (0.5%)</td>
</tr>
<tr>
<td>Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>182 (73.1%)</td>
<td>144 (73.5%)</td>
</tr>
<tr>
<td>Latina</td>
<td>5 (2.0%)</td>
<td>4 (2.0%)</td>
</tr>
<tr>
<td>More than one</td>
<td>15 (6.0%)</td>
<td>13 (6.6%)</td>
</tr>
<tr>
<td></td>
<td><strong>P=0.951</strong></td>
<td><strong>P=0.786</strong></td>
</tr>
</tbody>
</table>

*Significant association between background variable and dependent variable.*
Table 4.5 Continues.

<table>
<thead>
<tr>
<th>Background</th>
<th>Intends Contraception</th>
<th>Use Contraception</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work &amp; school</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>148 (61.4%)</td>
<td>121 (63.7%)</td>
</tr>
<tr>
<td>No</td>
<td>93 (38.6%)</td>
<td>69 (36.3%)</td>
</tr>
<tr>
<td>p=0.451</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Health insurance that pays for contraception.** |                       |                   |
| Yes                                            | 181 (77.0%)           | 151 (79.5%)       |
| No                                             | 54 (23.0%)            | 39 (20.5%)        |
| p=0.450                                        |                       | p=0.032*          |

| **College expenses paid**                       |                       |                   |
| None                                           | 71 (28.9%)            | 60 (30.8%)        |
| One-third                                      | 53 (21.5%)            | 44 (22.6%)        |
| One-half                                       | 12 (4.9%)             | 9 (4.6%)          |
| Two thirds                                     | 33 (13.4%)            | 29 (14.9%)        |
| All                                            | 77 (31.3%)            | 53 (27.2%)        |
| p=0.008*                                       |                       | p=0.646          |

| **Alcohol use**                                 |                       |                   |
| Rarely                                         | 194 (77.9%)           | 144(73.5%)        |
| About 50%                                      | 11 (4.4%)             | 10 (5.1%)         |
| Usually                                        | 5 (2.0%)              | 5 (2.6%)          |
| Always                                         | 1 (0.4%)              | 1 (0.4%)          |
| p=0.795                                        |                       | p=0.030*          |

*Significant association between background variable and dependent variable.
**Table 4.5 Continues.**

<table>
<thead>
<tr>
<th>Background</th>
<th>Intends Contraception</th>
<th>Use Contraception</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rural childhood</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47 (19.0%)</td>
<td>35 (18%)</td>
</tr>
<tr>
<td>No</td>
<td>200 (81%)</td>
<td>159 (82.0%)</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.006</strong></td>
<td><strong>p=0.081</strong></td>
</tr>
<tr>
<td><strong>Episodes of sex in 4 wks.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>125 (50.8%)</td>
<td>75 (38.9%)</td>
</tr>
<tr>
<td>1</td>
<td>16 (6.5%)</td>
<td>16 (8.3%)</td>
</tr>
<tr>
<td>2</td>
<td>20 (8.1%)</td>
<td>20 (10.4%)</td>
</tr>
<tr>
<td>3 or more</td>
<td>85 (34.6%)</td>
<td>82 (42.5%)</td>
</tr>
<tr>
<td></td>
<td><strong>p=0.918</strong></td>
<td><strong>p&lt;0.001</strong></td>
</tr>
</tbody>
</table>

*Significant association between background variable and dependent variable.

**Research Question Three: What is the Relationship between Background Factors, Independent Variables and the Intent to use Contraception?**

To answer research question three (What is the relationship between attitudes, perceived norms, and self-efficacy and the intent to use contraception correctly and consistently?), logistic regression was conducted. The assumptions of observations that were independent and independent variables that were linearly related to the logit score were checked and met. Because the background variables rural childhood and expenses for college paid were significantly associated with intent to use contraception, they were entered in Step 1. The model was significant, chi-square = 17.042, df 2, and p<0.001, N=243. Between six and 18.3% of the variance in intent to use contraception was
explained by this model. The Hosmer and Lemeshow test was not significant, indicating the data fit the model.

With significant background variables controlled, the three independent variables (attitude, perceived norms, and self-efficacy) were entered in Step 2. The model significantly predicted whether or not a participant intended to use contraception, chi-square = 29.47, df=5, n=261, p<0.001. The Hosmer and Lemeshow test was not significant, indicating the data fit the model. Between 11.4% and 30.8% of the variance was explained by this model. In the final model, attitude (p=0.001) and rural childhood (p=0.020) were significant predictors of intention to use contraception. For each one point increase in the total attitude score, the odds that a participant would not intend to use contraception declined. If a respondent reported they had a rural childhood, the odds that a participant did not intend to use contraception were lower. Please see Table 4.6.

Table 4.6

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes*</td>
<td>0.85</td>
<td>0.77 - 0.94</td>
<td><strong>0.001</strong>*</td>
</tr>
<tr>
<td>Perceived Norms</td>
<td>0.961</td>
<td>0.79 – 1.18</td>
<td>0.704</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>1.08</td>
<td>0.90 - 1.29</td>
<td>0.413</td>
</tr>
<tr>
<td>Rural childhood*</td>
<td>0.46</td>
<td>0.24 – 0.89</td>
<td><strong>0.020</strong>*</td>
</tr>
<tr>
<td>Expenses for college paid</td>
<td>2.03</td>
<td>0.62-6.72</td>
<td>0.244</td>
</tr>
</tbody>
</table>

*P<0.05
Research Question four: What is the Relationship between Background factors, Independent Variables and Contraceptive Use?

To answer research question four (What is the relationship between intention to use contraception, competence, and environmental factors and contraceptive use?), logistic regression was conducted, using data from 111 participants who reported one or more sexual partners in the previous year. The assumption of observation independence and linear relationship to the logit were checked and met. The following background variables were entered in Step 1: age, health insurance, alcohol use with sex, and intercourse amount in four weeks. The background variables do not predict whether a participant reported contraceptive use: \( \text{chi square}= 7.08, \text{df}=4, \text{p}=0.131 \).

Next, with background variables controlled, three independent variables were entered in Step 2: competency, environmental factors, and intent to use contraception. This model significantly predicted whether or not a participant reported contraceptive use, \( \text{chi-square}=14.81*, \text{df}=7, \text{N}=111, \text{p}=0.038 \). The Hosmer and Lemeshow Test was not significant, indicating the data fit the model. This model predicted between 12.5% and 26.2% of the variance in reported contraceptive use. Two variables significantly predicted contraceptive use: intent to use contraception (\( \text{p}=0.011 \)) and having health insurance that paid for contraception (0.022). When participants reported they intended to use contraception, they were 15 times more likely to report contraceptive use. When participants reported they had health insurance that paid for contraceptive use, they were six times more likely to report contraceptive use. Please see Table 4.7.
Table 4.7

*Odds ratio of Predictors of Contraceptive Use*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency</td>
<td>0.902</td>
<td>0.71-1.15</td>
<td>0.412</td>
</tr>
<tr>
<td>Environment</td>
<td>1.25</td>
<td>0.82-1.91</td>
<td>0.294</td>
</tr>
<tr>
<td>Intent to use contraception*</td>
<td><strong>15.37</strong></td>
<td><strong>1.85-127.87</strong></td>
<td><strong>0.011</strong>*</td>
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<tr>
<td>Age</td>
<td>1.48</td>
<td>0.71-3.05</td>
<td>0.430</td>
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<tr>
<td>Episodes of sex past four weeks</td>
<td>0.70</td>
<td>0.40-1.23</td>
<td>0.212</td>
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<td>Health insurance that pays</td>
<td><strong>6.23</strong></td>
<td><strong>1.30-29.94</strong></td>
<td><strong>0.022</strong>*</td>
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<td>for contraception</td>
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<td>Alcohol Use with sex</td>
<td>1.06</td>
<td>1.06-3.00</td>
<td>0.908</td>
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**Summary of Findings**

1. Eighteen women reported they either weren’t sure whether it was important to prevent pregnancy, or it wasn’t too important, or it wasn’t important at all. Interestingly, eighteen women also reported they do not intend to use contraception the next time they have sexual intercourse. Many women wrote directly on the survey that it wasn’t important to prevent pregnancy because they weren’t sexually active.

2. Most women intended to be protected from pregnancy the next time they have sexual intercourse (n=249, 92.2%).

3. Most women agreed preventing pregnancy is important or extremely important, considering what was going on in their lives (n=252, 93.3%).

4. Only 11 women reported a previous pregnancy, but 10 of those pregnancies were unintended.

5. The attitude scale has an adequate number of items and is a reliable scale.
6. Sexual activity is associated with: (a) more favorable attitudes toward contraceptive use; (b) a more supportive environment for contraceptive use; (c) and, less negative perceived norms.

7. When parents paid a higher percentage of college expenses, a participant was significantly more likely to intend to use contraception.

8. When a participant grew up in a rural area, they were significantly less likely to intend to use contraception.

9. As age increased, participants were significantly more likely to report contraceptive use.

10. Participants who reported alcohol use with sex were significantly more likely to report contraceptive use.

11. Sexual activity was measured three ways: Are you currently sexually active? How many times have you had sex in the past four weeks? And, how many male sex partners have you had in the past year? Participants who were sexually active using any one of these measures were significantly more likely to report contraceptive use.

12. For each one point decrease in a participant’s attitude scale score, participants were more likely to report they did not intend to use contraception. The odds ratio was 0.15.

13. If a participant had a rural childhood, they were also more likely to not intend to use contraception. The odds ratio was 0.54.

14. If a participant intended to use contraception, they were 15 times more likely to report contraceptive use.

15. If a participant had health insurance that paid for contraception, they were six times more likely to report contraceptive use.
CHAPTER 5
DISCUSSION

The Sample of Participants

Most young women from this sample intended to protect themselves from pregnancy the next time they engaged in sexual activity (92.2%). This is a higher number of women who intend to be protected from pregnancy than has been found by other researchers (Frost, Finer, and Lindbergh, 2012). It is possible that even though young women answered surveys in private, and had no identifying data on their surveys, that this question was answered in order to appear socially acceptable to the researcher, who was seated nearby. In other words, the Hawthorne effect could be responsible for the high number of women participating in this survey who intend to prevent pregnancy. But, it is also possible that this statistic is an honest reflection of the attitude of young women who are enrolled in college. The sample of women who participated in this research may actually be very highly motivated to avoid pregnancy in order to finish their college studies. Other researchers have found a relationship between motivation to avoid pregnancy and contraceptive use (Curtis, Evens, & Sambisa, 2012).

Sexual activity was associated with differences in attitudes, perceived norms, self-efficacy, and environmental factors regarding birth control, in this survey. Attitudes toward contraceptive use were more positive when respondents reported sexual activity. Likewise, perceived norms regarding contraceptive use were more supportive when respondents reported sexual activity. Negative impacts on attitudes and perceived norms regarding contraceptive use occurred more frequently when respondents were younger,
reported less sexual activity, and were from a rural area. Experience with contraception and sexual activity are factors that alter perceptions of contraceptive use among young adults. These observed differences in attitudes, and perceived norms before and after sexual activity reinforce how important sexuality education is prior to engaging in sex. The most unfortunate consequence of inadequate education during the teen years is that there is even less opportunity to receive contraceptive education as young adult women (Kirby, 2009).

Young women in this sample reported sexual behavior that is remarkably similar to sexual behavior reported by Willoughby in research that defined four sexual experience categories of young adults (2012). Willoughby found that 21.8% of young adults were confident abstainers from sexual activity who disapproved of pornography and premarital sex. Seventeen percent of young adults were technical abstainers who approved of pornography and pre-marital sex, but had very low rates of sexual behavior. Young adults who abstained from sexual behavior were more likely to be younger than those who engaged in sexual activity. In the current sample of young women, 34.2% of young women reported no sexual activity in the past year. Like Willoughby’s sample, these women tended to be younger. Young adults who were sexually active were clustered into two categories by Willoughby: average engagers and high frequency engagers. Average engagers were the largest group (36.9%), and usually had one partner (1.18) in the past year. In this sample, average engagers were also the largest group, with 39.8% reporting one sexual partner in the past year. Willoughby’s high frequency engagers (24.6% of his sample) reported the most sexual activity on all measures and had an average of 2.32 partners in the past year. In this sample, women reporting two or more
sexual partners in the past year comprised 26% of the sample. In Willoughby’s research, participants were assigned to a sexual experience group and then their attitudes toward marriage were analyzed, based on that sexual experience group. Participants with the most sexual experience indicated the highest levels of readiness for marriage. Participants in this sample were not asked whether they were married.

**The Survey Instrument**

The factor analysis indicated that questions designed to measure different independent variables, were in fact measuring different concepts. The scale used to determine attitude toward birth control use could be pared down to eight questions, that also had a high Cronbach’s alpha (0.867). Therefore, one can cautiously conclude the measure used for attitude in this research was valid and reliable. Reservations about this conclusion are described below.

Other scales were not as strong as the attitude scale. For example, the final perceived norms scale only consisted of five items, indicating that important aspects of perceived norms were not captured in this survey. Lacking an adequate measure of perceived norms may explain why subsequent statistical analysis failed to show an effect of perceived norms on intent to use contraception, and contraceptive use. Similarly, the competency scale had only three items used in subsequent analyses, and the environmental factors had only two. It is possible that significant background factors, such as current sexual activity and rural childhood, may load as items on one of the independent variable scales, if the questions had been designed so that they could be included in the factor analysis. While other researchers have asked about sexual activity on surveys, this is the first study to show that reported sexual activity is strongly
associated with contraceptive use among college women (Brunner Huber & Ersek, 2011). Additionally, this is the first research study to show that having had a rural childhood predicts one does not intend to use contraception, among college enrolled women.

While Nunally and Bernstein (1994) and Munro (2005) accept analyzing Likert scale data as interval data, both authors also state that the data should have a normal distribution. Scores on the subscales of the IBCU had very skewed distributions. Therefore, it is imperative that the factor analysis on this survey be repeated, with a broader sample of women before the survey or any of the scales are considered truly valid.

Another important finding from this study is that parents did not influence contraceptive use among young adult women. Campo, Askelson, Spies, and Losch, (2010) found that focus group participants identified parents’ possible knowledge that respondents were using contraception as a barrier to obtaining contraception. Frost, Lindberg, and Finer (2012) noted that the most important social reference in their study of young adult women and men was what friends thought about birth control. Unfortunately, IBCU did not include a question about what friends thought about contraception.

Bader, Kelly, Cheng, and Witt, (2014) found that perceiving birth control use as moral behavior was associated with having visited a clinic to obtain contraception. In the current sample of women, 83% responded that the idea that birth control is immoral is definitely or probably false. However the question regarding the morality of birth control did not load on any of the final factors that influenced contraceptive intent or use.
Factors that predict Intent to Use and Reported Use of Contraception

Consistent with the integrated model of behavior theory, this study suggests that two factors are the strongest predictors of whether one intends to use contraception: rural childhood, a background factor, and attitudes toward contraceptive use, an independent variable. Also in support of the theoretical model this research is based on, the strongest predictor of actual contraceptive use was intent to use contraception (OR= 15.37) and whether or not one had health insurance that paid for contraception (OR=6.23). These two predictors of contraceptive use were significant in spite of the fact that the sample size for that analysis had only 111 participants. Had the sample size been adequate (n=164), other background factors or independent variables (competency and environmental factors) may have predicted contraceptive use also.

A Rural Childhood

Because having a rural childhood emerged as a background factor that predicted participants did not intend to use contraception, it is important to understand how rural environments differ from urban landscapes. In this sample of 270 women, 20% reported having had a rural childhood, and three out of four of those rural participants were attending a community college (College 1). Thirty-seven percent of Missourians (2.2 million people) live in rural counties, which is defined as “not urban” by the US Census Bureau (Missouri Department of Health and Senior Services, n.d.). Socio-economic differences exist between rural and urban counties in Missouri: the rural poverty rate is higher; unemployment is higher; and rural residents are less likely to have health insurance. There are fewer health care providers in rural areas, and the death rate overall is higher in rural areas especially from accidental death and suicide.
The American Congress of Obstetrics and Gynecology states that women’s reproductive health care services in rural areas are lacking, leaving many women without access to contraception (ACOG Committee Opinion, 2014). Additionally, social norms regarding contraception are different in rural areas, where women have higher rates of sterilization for birth control. Finally, there are 98 Title X funded clinics in Missouri, that served over 60,000 women in 2013, but the number of women who need access to contraceptive care is in excess of 300,000 women (Frost, Zolna, & Frohwirth, 2013). While all women in this survey’s sample were currently living in an urban area of Missouri, having limited access to contraception during adolescence may have also limited these women’s personal and vicarious experiences with contraception, and consequently their intent to use contraception.

Researchers also have limited access to people who live in rural areas, unless potential participants have joined an institution such as the military or a college. Therefore, very little is known about the experience of learning about, accessing and maintaining contraception in a rural area. It is possible that women in rural areas have less privacy when buying contraception products, since they may know, or even be related to people who serve them at the pharmacy. Less privacy may inhibit younger women especially from buying contraception. One qualitative study explored the social norms in rural Oregon regarding talking with one’s daughter about sexuality and contraception (Noone & Young, 2010). The participants identified rural lifestyle elements that influenced discussions about sexuality between mothers and daughters, including: isolation; less privacy; stigma associated with teen sexuality; the opportunity
to witness animals having sex; and long car-rides that provided the opportunity for in-depth conversations regarding sexuality.

Understanding the unique needs of women from rural areas is important in planning health services both in rural communities and in settings where formerly rural residents are likely to live. Future research should explore attitudes, social norms, and self-efficacy regarding contraception among women who have relocated to an urban setting as a young adult. Additionally, health policies at community colleges and vocational schools should address unique needs these young women face since both of these settings will attract young women from rural environments.

**Attitudes toward Contraception**

Other researchers have investigated the association between attitudes and contraceptive use, but the findings have not been consistent. However, inconsistent findings may be the result of using attitude questions that have not been validated with factor analysis. The items that loaded on the attitude scale from this survey were either unique to this survey, or derived from work by Pratte, et al., (2010) or work by Kaye, et al. (2009). The attitude scale items unique to this survey were: I enjoy sex more using contraception; I feel good using contraception; I can handle any problems with contraception; and, it is easy to use contraception. The items derived from work by Pratte, et al., have previously been found to load on an attitude scale that was part of a survey about condom use. These items were: my partner is happier knowing contraception is used; contraception is safe; I can suggest condom use; and, contraception prevents pregnancy. Finally, one item loaded on the attitude scale that derived from work by Kaye, et al.: it is important for people like me to have contraception available.
Lee and Jezewski (2007) systematically reviewed attitudes toward oral contraceptives. These authors defined attitudes as having affective, cognitive, and behavioral dimensions. The affective dimension, in turn, consists of feelings and emotional reactions. The cognitive dimension of attitudes consists of perceptions, beliefs, and expectations, and the behavioral dimension of attitudes corresponds to overt action, or intended behavior. The nine items on the IBCU that comprised the attitude scale fit the affective and cognitive dimensions of attitudes, as described by Lee and Jezewski. The affective attitude items were: partner happier knowing contraception was used; feel good using contraception; enjoy sex more. The cognitive attitude items were: important that others use contraception; easy to use contraception; safe to use contraception; important to have contraception available; and, contraception prevents pregnancy. All of these items reflect an attitude of positive expectations related to contraceptive use.

Frost, Lindbergh, and Finer (2012) studied contraceptive knowledge, norms, and attitudes and how those independent variables were associated with contraceptive use. Their findings indicated that objective knowledge explained 10-13% of the variance in contraceptive use, and attitudes explained 3% of the variance. Objective knowledge was measured by how many correct answers participants scored on a quiz. The two attitude questions were answered on a five point Likert scale and addressed whether respondents viewed contraception fatalistically. Attitudes explained more variance when explaining inconsistent contraceptive use (11%), expect to have unprotected sex (9%), and no use of contraception (8%). Approximately half of the respondents had attended college, and both men and women were surveyed. Unlike Frost, Lindbergh, and Finer, this research using the IBCU showed that attitudes and rural childhood explained between 11 and
30.8% of the variance in intent to use contraception. None of the attitude questions in IBCU measured fatalism. Additionally, the IBCU survey did not assess how correct a participant’s factual knowledge was on contraception. Finally, in the present study, intent to use contraception, and having health insurance that paid for contraception accounted for 12.5% to 26.2% of the variance in contraceptive use, and neither of these factors were studied by Frost, Finer, and Lindbergh (2012).

**Environmental Factors, Self-efficacy, Health Insurance, and Alcohol use**

If participants had health insurance that paid for contraception, they tended to believe that birth control was affordable for their peers. However, one out of five participants did not have health insurance, and therefore did pay more than their peers for birth control. Another interesting finding is that if respondents worked, they reported more competency with birth control. Additionally, women who had not been pregnant reported more competence with birth control, than women who had been pregnant. It seems that competency (and previous failure) in other areas of life carry over into perceived competency around birth control.

Having health insurance that paid for contraception emerged as an important independent factor that predicted contraceptive use. In fact, even with a smaller than desirable sample size, the odds of reporting contraceptive use were six times higher if one had health insurance that paid for it. Decades of research on contraceptive uptake in the United States has documented the inverse relationship between cost and access to contraception (Hubacher, Spector, Monteith, Chen, & Hart, 2015). Currently, women without health insurance use shorter acting, less expensive forms of contraception, like combined hormonal contraceptive pills. Directives from the Affordable Care Act have
made longer acting, more reliable forms of contraception, like intrauterine devices, more affordable for women with health insurance. Socially disadvantaged women, who are more likely to have an unintended pregnancy, deserve access to the same, highly effective, long acting forms of contraception as their more advantaged counterparts.

One surprising finding was that women whose parents’ paid for their college were more likely to report intent to use contraception in the bivariate analysis. However, in the final logistic regression model, having parents pay college expenses did not predict actual contraceptive intent. Perhaps young women enrolled in college are motivated to take care of themselves regardless of the financial level of parental support. Or perhaps having the opportunity to enroll in college implies that a person has achieved the necessary financial support to also afford contraception. Alternatively, parental financial support could be an environmental factor that is significant, a relationship that could be more evident had the question been designed to fit into the cluster of environmental questions. Finally, had the sample size of the second logistic regression been larger, parental support may have emerged as a factor that predicts contraceptive use.

In other studies of contraceptive use among college age women, alcohol use was associated with reduced use of contraception, especially since alcohol use was associated with unplanned casual sexual encounters (Campo, Askelson, Spies & Losch, 2010; Higgins, Trussell, Moore, & Davidson, 2010). Once again, had the sample size been larger for the second logistic regression, alcohol use may have emerged as a significant predictor of contraceptive use. Future surveys should include a Likert scale question about alcohol use to test the significance of this item.
Strengths, Limitations, and Future Research

The findings from this study are based on an adequate number of surveys to conduct a factor analysis on the instrument, and show construct validity. Few other studies of contraception are based on surveys that show constructs validated by factor analysis, and then are shown to be reliable by Cronbach’s alpha. A validated survey is important because it allows researchers to measure differences in important factors that guide behavior, but differ in sub-populations of interest. Additionally, a validated survey can allow researchers to accurately measure the effect of educational interventions designed to influence contraceptive behavior. In future research, researchers should use the survey questions from the IBCU that were valid, and add questions that are further tested. Doing so will improve the construct validity of scales measuring especially self-efficacy, competence, and environmental factors.

An improved survey tool should be tested on a wider sample of young women and on a sample of men. Doing so will improve the distribution of responses on the scales, and make the survey more generalizable. Validating the survey tool with men will allow researchers to achieve many of the same goals that a validated survey has when used with women. Differences in sub-populations of men can be measured. And, the effect of an educational intervention designed for men can be measured. Finally, once the survey is validated with male participants, researchers can begin to study the differences between men’s and women’s attitudes toward contraception. Understanding more about men’s role in contraception will also allow researchers to design interventions for couples, which is the context in which most contraception is used.
This study has several limitations. First, this is a cross-sectional descriptive survey, based on a theoretical model. Therefore, the relationships between the variables are associations, and cohort studies should be completed to show causation between the independent variables and dependent variables. Secondly, this sample consists of a convenience sample of young women, who were present in a college campus commons area. Therefore, this research is not generalizable to all college women, nor can it be generalized to young women not in college. Additionally, self-report data can be subject to reporting biases, including recall bias and wanting to please the researcher. Finally, only the attitude scale had a sufficient number of final items, in addition to high reliability. Attitude is the only construct that was accurately measured with the IBCU.

Future research should be directed to two areas: improving the survey that measures contraceptive use; and developing an educational intervention to address contraceptive knowledge deficits. Many questions were not included in this survey that may predict contraceptive intent and use. Many studies suggest that the experience of intimate partner violence negatively impacts self-care regarding contraception. In fact, sabotage of contraception efforts can be a control strategy some men employ (Miller et al., 2010; Pallito, Campbell, & O’Campo, 2005). Secondly, the literature on failure to use contraception clearly implicates the belief that one cannot get pregnant as an influence on contraceptive use (Biggs, Karasek, & Foster, 2012; Frost et al., 2012). An assessment of the belief that one cannot get pregnant was not included in this survey. As noted previously, in future surveys close friends’ attitudes toward contraception should be measured as a component of social norms. Finally, whether or not participants have correct knowledge regarding how to use contraception and manage side effects was not
studied, yet accurate knowledge predicts contraceptive use in other research (Frost et al., 2012).

Lastly, researchers should consider how male partners influence contraceptive use in relationships because very little is known about this, and intuitively the male sexual partner seems like an important influence. Bruner Huber, and Ersek (2011) asked college women who should be responsible for birth control in a relationship, and who actually is responsible. Eighty-nine percent of women in their sample felt contraceptive responsibility should be shared, but only 58% reported that contraceptive responsibility actually was shared. Wildsmith, Manlove, and Steward-Streng, (2015) studied the associations between relationship characteristics and contraceptive use, among co-habitating and dating young adult couples. These authors estimate that 35% of young adults aged 18-25 are in dating relationships; 20% are co-habitating; and 21% are married. Their findings show that as young adults experience dating and co-habitating with more or less intimacy, their use of specific types of contraception varies (condoms vs. hormonal contraception). Specifically, as couples were older and co-habitating they were less likely to use both condoms and hormonal contraception.

**Recommendations**

An educational program for young women and men on contraception and normal human sexuality should be offered on all college campuses. While larger campuses have the resources for such a program, smaller community colleges can also offer smaller scale educational programs to their young adult students. Other venues where young adults can be reached for sexuality and contraception education includes community centers, libraries, churches, and adult education courses. But accessing young adults who remain
in rural settings will be difficult if material is presented in person. Virtual program
delivery may be an alternative for people in rural areas with internet access.

One way all nurses can advocate for young women, and prevent unintended
pregnancy, is to promote inexpensive access to long acting reversible forms of
contraception. In Missouri, we have the opportunity to expand Medicaid and implement
the Affordable Care Act. Doing so would improve access to contraception for young
women, especially in rural areas, similar to the way the CHOICE project impacted poorer
women in St. Louis. When the Contraceptive CHOICE project provided long acting
reversible contraceptives at no cost to poorer women, those women enrolled to receive
this form of contraception and succeeded in preventing unintended pregnancy
(McNichols, Madden, Secura, & Peipert, 2014). Medicaid expansion can make
contraception more accessible in rural areas where young women are more likely to face
numerous barriers to obtaining and using contraception.

Conclusion

This research has identified important survey questions to use when assessing
attitudes toward contraceptive use. Additionally, this research provides support for the
integrated theory of behavioral modification. Finally this research identifies important
factors that predict contraceptive use: attitude toward contraceptive use, rural childhood,
intent to use contraception and health insurance that pays for contraception. New
knowledge about contraceptive use is important because contraception is the only reliable
way to prevent unintended pregnancy, a condition that threatens the health of the next
generation and their mothers. Men and women can gain control over their own destiny
and the health of their children through family planning. Therefore finding ways to
empower young people to take full advantage of contraception and have families when they want them deserves our full attention.
Appendix A

Influences on Birth Control Use
Influences on Birth Control Use

1. Do you plan to become pregnant in the next 6 months? (yes/no)

2. Gender (male/female)

3. Age

4. What race/ethnicity do you identify yourself as? (Mark all that apply).
   i. American Indian or Alaska Native
   ii. Asian
   iii. Black or African American
   iv. Native Hawaiian or Other Pacific Islander
   v. White
   vi. Hispanic or Latino

5. Currently completed how many years of school (12 yrs., 1yr college; 2 yrs college; 3 yrs college; 4 or more yrs of college)

6. Currently working? (yes/no)
   i. Do you have to work to help pay for college? (yes/no)
   ii. Are you a full-time student? (yes/no)
   iii. Do you have health insurance that covers birth control? (yes/no)
   iv. What percent of your college expenses is paid for by your parents?
      1. None; 2. 1/3 or less; 3. ½ or less; 4. 2/3 or less; 5. All.

7. Are you currently sexually active with men? (yes/no)

8. Last time you had sex (penis in vagina), did you use birth control? (yes/no)

9. When you have sex, do you keep the man’s penis away from your vagina to prevent pregnancy? (yes/no)
10. Last time you had sex, did you use a condom? (yes/no)
11. How many times have you been pregnant in your life time?
   a. If more than “0”, how many pregnancies were a surprise?
12. Do you intend to be protected from pregnancy the next time you have sex? (yes/no)
13. Do you use alcohol or other substances before you have sex
   a. Rarely    b. <25% of the time    c. about half of the time
   d. usually   e. always
14. While growing up did you live in a town that had more than 2,500 people? (yes/no)
   a. If yes, for how many years before age 18 did you live in a town with more than 2500 people?
15. Do you currently use birth control? (yes/no)
   a. If yes, do you use birth control to prevent pregnancy? (yes/no)
   b. If no, have you used birth control to prevent pregnancy in the past? (yes/no)
16. Are you currently in a committed relationship with a man? (yes/no)
   a. If yes, for how long?
      i. <4 mos., ii. < 1 year; iii. >1 year
17. Thinking about the last four weeks, how many times have you had sexual intercourse with a male (in the past four weeks)?
18. How many males have you had sexual intercourse with in the past 12 months?
19. Thinking about your life right now, how important is it to avoid becoming pregnant?

1. Very important  somewhat important  3. not sure  not too important  5. not important

Your views on birth control…

1. How likely is it that your partner would be happier knowing birth control was used in your relationship?

1  2  3  4  5

Not at all likely  Very Likely

2. How likely is it that you would enjoy sex more if you were using birth control?

1  2  3  4  5

Not at all likely  Very Likely

3. How likely is it that you would be protected from pregnancy if you were using birth control?

1  2  3  4  5

Not at all likely  Very Likely

4. How likely is it that using birth control would be easy for you?

1  2  3  4  5

Not at all likely  Very Likely
5. How likely is it that using birth control would be safe for you?

1 2 3 4 5
Not at all likely Very Likely

6. How likely is it that you would feel good if you used birth control?

1 2 3 4 5
Not at all likely Very Likely

7. How likely is it that birth control is healthy for you?

1 2 3 4 5
Not at all likely Very Likely

8. How likely is it that your partner would be angry if you told him you were using birth control?

1 2 3 4 5
Not at all likely Very Likely

9. How likely is it that using birth control would ruin the sexual mood?

1 2 3 4 5
Not at all likely Very Likely
10. How likely is it that your partner would think you were having sex with another person if you were using birth control?

1  2  3  4  5

Not at all likely  Very Likely

11. How likely is it that your partner would leave you if you said you had to use birth control?

1  2  3  4  5

Not at all likely  Very Likely

12. How likely is it that your partner would refuse to have sex if you said you wanted to use birth control?

1  2  3  4  5

Not at all likely  Very Likely

13. How likely is it that birth control is harmful to you?

1  2  3  4  5

Not at all likely  Very Likely

14. How likely are you to have problems with birth control?

1  2  3  4  5

Not at all likely  Very Likely
15. In a sexual relationship, the woman decides whether or not to use birth control.

1 2 3 4 5

Not at all true Very True

16. In a sexual relationship, the man decides whether or not the woman uses birth control.

1 2 3 4 5

Not at all true Very True

17. In a sexual relationship, the man and woman decide together whether or not to use birth control.

1 2 3 4 5

Not at all true Very True

18. Preventing pregnancy with birth control is morally wrong.

1 2 3 4 5

Not at all true Very True
19. How important is it that your peers use condoms in one-night stands/flings?
   1  2  3  4  5
   Not at all important  Very Important

20. How important is it that people like you use birth control to prevent pregnancy?
   1  2  3  4  5
   Not at all important  Very Important

21. How important is it that people like you always have birth control available during the next month?
   1  2  3  4  5
   Not at all important  Very Important

22. How important is it that people like you plan a pregnancy with a committed partner?
   1  2  3  4  5
   Not at all important  Very Important

23. Thinking about your life right now, how important is it to avoid becoming pregnant?
   1  2  3  4  5
   Not at all  A little important  I don’t know.  Somewhat important  Very important
24. How confident are you that you could discuss using birth control with your partner?

1  2  3  4

5

Not at all confident  Very confident

25. How confident are you that you could suggest using birth control to prevent pregnancy?

1  2  3  4  5

Not at all confident  Very confident

26. How confident are you that you could suggest using a condom to prevent sexually transmitted infections?

1  2  3  4  5

Not at all confident  Very confident

27. How confident are you that you could use birth control without having it break the sexual mood?

1  2  3  4  5

Not at all confident  Very confident
28. How confident are you that you could use birth control correctly?

1 2 3 4 5
Not at all confident Very confident

29. How confident are you that you could handle any problems with your birth control?

1 2 3 4 5
Not at all confident Very confident

30. I have used birth control correctly in the past.

1 2 3 4 5
Not at all like me Very much like me

31. My parents believe I should use birth control to prevent pregnancy.

1 2 3 4 5
Not at all like me Very much like me

32. Birth control is affordable for me.

1 2 3 4 5
Not at all like me Very much like me
33. Birth control is affordable for my peers.

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Appendix B: Informed Consent
CONSENT FORM FOR PARTICIPATION IN A RESEARCH STUDY

Influences on Birth Control Use

Introduction

You are being asked to volunteer for a research study. This study is being conducted at University of Missouri, Columbia, and Moberly Area Community College.

The researcher in charge of this study is Valerie Bader. Ms. Bader’s dissertation chair person is Dr. Patricia Kelly.

The study team is asking you to take part in this research study because you are a woman between the ages of 18 and 24, who does not plan to become pregnant in the next six months. Research studies only include people who choose to take part. Please read this consent form carefully and take your time making your decision. This consent form explains what to expect: the risks, discomforts, and benefits, if any, if you consent to be in the study.

Background

An unintended pregnancy is one that occurs at the wrong time, or is not wanted. Women with an unintended pregnancy who give birth get sick more often, and their babies get sick more often. Birth control can prevent unintended pregnancy.
**Purpose**

The purpose of this research study is to *learn more about feelings and knowledge about birth control use. This study will tell researchers how to help women use birth control, and prevent unintended pregnancy.*

You will be one of about **270** subjects who participate in this study.

**Study Procedures and Treatments**

*If you agree to volunteer, you will be given a paper survey and a pencil. Please answer the questions on the survey by circling the response that is true for you, or writing in the information. Completing this survey will take about 20 minutes.*

If you agree to take part in this study, you will be involved in this study for the 20 minutes we estimate it will take you to complete the survey. We will only contact you after you complete the survey if you enter and win the drawing for an iPad mini.

**Possible Risks or Side Effects of Taking Part in this Study**

*The risks to you from participating in this study are expected to be minimal. You may become psychologically uncomfortable answering some of the questions in the study. We believe there is no way anyone could link your answers to questions back to you.*
Possible Benefits for Taking Part in this Study

There are no benefits to you for taking part in this study.

Other people may benefit in the future from the information about birth control that comes from this study.

Payment for Taking Part in this Study

To compensate you for your time you may put your e-mail address on a raffle ticket, which will be entered into a drawing for one of four iPad mini’s. We will e-mail you if you win the drawing.

Contacts for Questions about the Study

You should contact the IRB Administrator of UMKC’s Adult Health Sciences Institutional Review Board at 816-235-5927 if you have any questions, concerns or complaints about your rights as a research subject. You may call the researcher Valerie Bader at (573) 673-2219 if you have any questions about this study. You may also call her if any problems come up.

Voluntary Participation
Taking part in this research study is voluntary. If you choose to be in the study, you are free to stop participating at any time and for any reason.

You have read this Consent Form or it has been read to you. You have been told why this research is being done and what will happen if you take part in the study, including the risks and benefits. You have had the chance to ask questions, and you may ask questions at any time in the future by calling Valerie Bader at (573)673-2219. By completing the survey, you volunteer and consent to take part in this research study. Study staff will give you a copy of this consent form, at your request.
Appendix C: Poster at Research Table
COMPLETE A
SURVEY---
AND ENTER A

Are you a woman between 18 and 24?

Who is not trying to become pregnant…

Will you take a survey?

The survey takes 20 minutes to complete.

Share your thoughts and feelings about birth control.

University of Missouri, Kansas City
School of Nursing
Pat Kelly, PhD,
Appendix D: MACC Approval Letter
Research Proposal Application

Principal Investigator: Yolanda Batler, MN, CNM

Affiliation: Doctoral candidate at UNMC School of Nursing

Project Title/Purpose: An Application of the Integrated Behavioral Model on Contraceptive Intention and Use.

Purpose: This descriptive study examines the relationship between contraceptive behavior and: (a) attitudes toward contraceptive use, (b) perceived norms regarding contraceptive use, and (c) self-efficacy regarding contraceptive use.

Date Submitted: March 21, 2012

Description of Project:

The specific aim of this project is to explore the contraceptive use patterns among young women (ages 16-24) based on attitudes toward contraceptive behavior, perceived norms regarding contraception behavior, and self-efficacy regarding contraception behavior using a theoretical model as the guiding framework. The research questions guiding the study are: (1) what is the relationship between attitudes, perceived norms, and self-efficacy and the intention to use contraception among young women, and (2) what is the relationship between demographic variables (age, ethnicity, marital status, urban or rural residence) and psychological variables (attitudes, perceived norms, and self-efficacy) and intention to use contraception and reported contraceptive behavior.

Sample: A minimum of 130 female students, ages 16-24, will complete a survey examining attitudes, social norms, and self-efficacy, as these relate to contraceptive use. A sample size of 50 women from each campus will show a medium effect, when alpha equals 0.05 and power equals 0.80. Methods: The survey will be encoded and administered via the internet using this key. Analysis: Relationships between socio-demographic variables and attitudes, social norms, and self-efficacy for contraceptive use will be examined.

Significance: Findings from this research can be used to inform clinical strategies and to develop more effective messaging and educational programming about sexuality.

[Signature] [Date]
Appendix E: UMKC IRB Approval Letter
NOTICE OF EXEMPT DETERMINATION

Principal Investigator: Andrew J. Barry
3544 Catherin Street
Kansas City, MO 64110

Protocol Number: 14-114
Protocol Title: Influences on Self-Control
Type of Review: Administrative Review
Date of Determination: 04/11/2014

Dear Dr. Barry,

The above referenced study was reviewed and determined to be exempt from IRB review and approved in accordance with the Federal Regulations 45 CFR Part 46.101(b).

This determination includes the following documents:

Attachments:
- IRB Application
- Revised Protocol
- Consent Form
- UMKC Site Approval
- IRB Training Certificate
- Survey/DCU

You are required to submit an amendment request for all changes to the study. To prevent withdrawal of the exempt determination for your study. When the study is complete, you are required to submit a Final Report.

Please contact the Research Compliance Office (email: milo@umkc.edu) or phone (816) 235-5757 if you have questions or require further information.

Thank you,
Mary Demarest
IRB Officer
Appendix F: University of Missouri Health Sciences IRB Approval Letter
August 13, 2014

This project was reviewed and approved by the University of Missouri – Columbia Health Sciences Institutional Review Board (HSIRB) according to the terms and conditions described below:

Project Number: 1212980
Project Title: Influences on Birth Control
Principal Investigator: Bader, Valerie Gwen
Primary Contact: Bader, Valerie Gwen
Approval Date: Aug 12, 2014
Expiration Date: Aug 12, 2015
Approval Category: Exempt 45 CFR 46.101(b) <2>
Level of Review: Exempt

All documents reviewed and approved can be found in digital documents and are highlighted green.

You are expected to comply with the requirements outlined in the MU HSIRB Policies (http://research.missouri.edu/hsirb/policies.htm). This includes reporting any unanticipated problems involving risk to research participants or others.

Changes in the conduct of the study, including consent process or materials, require submission of an amendment form which must be approved by the HSIRB prior to implementation of the changes. Changes in the source of study funding must also be reported.

According to federal regulations, this project requires IRB continuing review. As such, prior to the expiration date above, you must submit either an Exempt Annual Update (EAU) or the Completion/Withdrawal Form. If you have questions or require additional information, please contact us at (573) 882-3181 or hsirb@missouri.edu

Sincerely,
Betty Wilson
Compliance Officer, HSIRB
Appendix G: Permission to use previously published surveys.
Condom attitudes, norms and self efficacy scale

Bader, Valerie... Thank you! I will keep you posted. Valerie Bader, MN, CNM Clinical Instructor of Nursing 5424 Sinclair School of Nursing Un...

Bull, Sheana [Sheana.Bull@ucdenver.edu]

Hello Ms. Bader, by all means, please use the scale, I'm glad that you can adopt it. I'd love to learn about the results.

Thanks
Sheana Bull

Bader, Valerie G.

To: sheana.bull@ucdenver.edu
Cc: Enriquez, Matthew K.; Bader, Valerie G.

Dr. Bull:

Currently I am completing my PhD work at University of Missouri in Kansas City, School of Nursing. I have been searching the literature for a scale that measures contraception use based on an integrated theory of behavior (self-efficacy, theory of reasoned action, and health belief model) as described by the Institute of Medicine. In looking for a scale I came across your article entitled “Factor Analyses of Condom Attitudes, Norms, and Self-efficacy Measures in Diverse Samples”.

I would like your permission to use the 21-item scale described in your article, modified for contraception use. I will also add an item regarding intention to use contraception.

Thank you for considering this. I look forward to hearing from you.

Valerie Bader, MN, CNM
Clinical Instructor of Nursing
5424 Sinclair School of Nursing
University of Missouri
Columbia, Missouri 65211
573.673.2219

permission to use survey questions from The Fog Zone

Kelleen Kaye [kkaye@thencc.org]

To: Bader, Valerie G.
Cc: Kelly, Patricia J., Enriquez, Matthew

Dear Ms. Bader,

Thank you for your e-mail and for your interest in our survey. We welcome the opportunity to see the Fog Zone questions replicated in other surveys, so please feel free to include your questions of interest. We only request attribution in your work to the extent that would be appropriate.

Good luck with your research,

Kelleen

Kelleen Kaye
Senior Director of Research
The National Campaign to Prevent Teen and Unplanned Pregnancy
202-476-8512

“Check out our blog”
http://blog.thenationalcampaign.org
www.thenationalcampaign.org
www.thetenne.org

Bader, Valerie... Dear Ms. Kaye: I am writing to request permission to use survey questions from The Fog Zone in a survey I intend to conduct...
REFERENCES


http://doi.org/10.1016/j.contraception.2009.12.004


Noone, J., & Young, H. (2010). Rural mothers’ experiences and perceptions of their role in pregnancy prevention for their adolescent daughters. *Journal of Obstetric,


Vita

Valerie Gwen Bader was born in Bremerhaven, Germany and began kindergarten in 1966 in Rota, Spain. She attended nine different schools before graduating from high school in 1979, the same year she enrolled in the University of Missouri. She was awarded a BSN in 1984. Ms. Bader worked as a staff nurse in a Level 2 nursery and a labor and delivery unit before enrolling at the University of Washington. She graduated with a Master of Nursing in 1995 and successfully passed the American College of Nurse Midwives Certification exam the same year. She has worked as a staff nurse or a nurse-midwife for over 30 years. Ms. Bader has provided primary care to women, including contraception, and attended home and hospital birth.

Ms. Bader loves health and nursing education. She has taught childbirth education classes, staff development courses, and nursing classes at the undergraduate and graduate level. Ms. Bader has taken undergraduate nursing students on study abroad trips for their community health course to Cape Coast, Ghana, and Monte Verde, Costa Rica.

Ms. Bader was inspired to study unintended pregnancy from her clinical practice where she met numerous women who were pregnant and did not want to be. She intends to continue teaching nursing for the foreseeable future. Ms. Bader lives with her husband of 30 years, Eric, and their dog, Bandit. Ms. Bader enjoys traveling, knitting, gardening, and reading, and she has no plans to move ever again.