BLACK PARENTS' BELIEFS, ATTITUDES, AND HPV VACCINE INTENTIONS:

A MEDIATION MODEL

by

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ABSTRACT OF THE DISSERTATION

Black Parents’ Beliefs, Attitudes, and HPV Vaccine Intentions:
A Mediation Model

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The purpose of this study was to examine the determinants of Black parents’ intention to have their daughters receive the HPV vaccine. Specific determinants consisted of constructs from the Theory of Planned Behavior (TPB). Relationships between attitudes and HPV vaccine intentions, as well as the relationship between behavioral beliefs and attitudes among Black parents were explored. A mediation model was tested to explain the relationship between behavioral beliefs, attitudes, and HPV vaccine intention.

A descriptive correlational design was used to examine the hypothesized relationships. A convenience sample of 232 Black parents with daughters between the ages of 9 and 17 years was recruited. A researcher developed instrument, HPV Beliefs, Attitudes, and Intention Questionnaire, and a demographic questionnaire were used to collect data.

Study results indicated that HPV parental attitudes were found to be a significant predictor of vaccine intention ($\beta = 0.85, p < .001$). A significant relationship between religious and mistrust behavioral beliefs and attitudes was found among Black parents ($\beta = .23, p < .001$). In addition, parental vaccine attitudes were found to completely mediate the relationship between HPV vaccine behavioral beliefs and parental HPV vaccine
intention.

Testing of the theorized relationships allowed for the exploration of specific beliefs and attitudes of Black parents which may lead to a better understanding of predictors of behavioral intentions. Replication of this study in multiple geographic settings would be prudent to increase the generalizability of study findings.
Preface

I would like to thank my husband, Cliff and my children Daniel, Alex, and Kathryn for their endless support during this endeavor. Their love and encouragement have been a source of motivation for me. My grandson, Max provided the inspiration I needed to finish this project.

I am grateful to the members of my committee for their support and expertise. In particular, I would like to thank my chairperson, Dr. Charlotte Thomas-Hawkins for her guidance, knowledge, and patience. She is my role model and I was blessed to have her as my chair.
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Chapter 1
The Problem

Human papillomavirus (HPV) is the most common sexually transmitted infection (STI) with approximately 20 million Americans currently infected and another 6.2 million people becoming newly infected each year. At least 50% of sexually active people are estimated to become infected with HPV at some point in their lives (Centers for Disease Control and Prevention (CDC), 2006). Among sexually active females, the incidence of HPV infection is highest for those in the youngest age groups, approximately 40% of those aged 14-19 years and 50% of those aged 20-24 years. Incidence declines substantially after 24 years of age (CDC, 2004).

Researchers using data from the 2003-2004 National Health and Nutrition Examination Survey found the incidence of HPV infection in non-Hispanic Blacks to be 39.2%, non-Hispanic Whites 24.2%, and Mexican Americans 24.3% (Dunne et al., 2008). Non-Hispanic Black women, compared with White women, had approximately 50% higher odds of infection with HPV, and among women living above the poverty line, rates of HPV were significantly higher in Black women than White women (Kahn, Lan, & Kahn, 2007).

While many HPV infections are asymptomatic and transient, infection with HPV is the most common cause of cervical cancer (Newmann & Gardner, 2005). There are more than 100 known strains of HPV; 15-20 of these strains have been associated with the development of cervical cancer. Although regular screening through Papanicolaou (Pap) tests has contributed to a sharp decline in cervical cancer incidence, more than 11,070 women were newly diagnosed with cervical cancer in the United States (U.S.) in
2008, and approximately 3,870 will die annually (National Cancer Institute, 2008). In addition to cervical cancer, HPV is associated with less common types of cancers including oral, vulvar, vaginal, penile, anal, and oropharyngeal cancer. These HPV-related cancers bring the total incidence rate in females to approximately 14,000 (CDC, 2008). HPV has also been detected in prostate tumors and on rare occasions, can be transmitted from mother to child causing respiratory papillomatosis (Saslow, Castle, & Cox, 2007).

Difficulties in diagnosing HPV increase the likelihood that women will contract the disease. The majority of HPV infections in males and females are asymptomatic or sub-clinical therefore, most individuals infected with HPV are unaware of their infection. This allows for transmission to occur without knowledge of either partner (Giuliano, 2007). HPV infection in men contributes to HPV infection and subsequent cervical disease in women. In addition, diagnosing cervical cancer may be delayed due to the difficulty in obtaining a specimen from precancerous lesions typically located high in the endocervix (Rodgers & Cantu, 2009).

The economic costs of HPV-related genital warts and cervical disease, which includes cervical cancer screening, are estimated to be at least $4 billion annually in the U. S. with the majority of the money expended used for follow-up care because of abnormal Pap test results (Chesson, Ekwueme, Saraiya, & Markowitz, 2008). Direct medical costs associated with treating a patient with cervical cancer range from $9,200 to $13,000 per person, and the cost of surgery to remove a precancerous lesion ranges from $1,000 to $4,500 per person. These annual treatment costs make HPV one of the most costly sexually transmitted diseases after HIV/AIDS (Chesson, Blandford, & Gift, 2004).
Research indicates that there are disparities in disease and mortality rates for cervical cancer. Race and ethnicity play a central role in the epidemiology of cervical cancer in the U.S. (Brewer & Fazekas, 2007; Vetter & Geller 2007). Hispanic and Black women are approximately 1.5 times more likely to develop cervical cancer than White women, and are more likely to die as a result (CDC, 2005). One factor attributed to increased cervical cancer rates among minority women is low socioeconomic status which in these groups, has a negative impact on screening, diagnosis, and treatment of the disease (Newmann & Garner, 2005).

**HPV Vaccine**

In June 2006, the Food and Drug Administration (FDA) approved the first HPV vaccine. The development of this vaccine has the potential to prevent a substantial number of HPV infections and the majority of cases of cervical cancer. This is an important public health achievement. The CDC's Advisory Committee on Immunization Practices (ACIP) (2007) recommends routine vaccination of 11-12 year old girls and a catch-up vaccination for females 13-26 years of age. This primary prevention tool could significantly reduce the rates of cervical cancer, but broad vaccination coverage will be required. This primary prevention effort will involve potential vaccine recipients, parents of adolescent females, and healthcare providers. All of these groups will need to understand the necessity for protection against HPV.

The three dose HPV vaccine is the most expensive childhood vaccine, costing $120 per injection ($360 for the series) (Gonik, 2006). Most private and public sector payors will cover the vaccine, but policies concerning 19 to 26 year old women have yet to be determined (Gerberding, 2007). In addition, very few preadolescent (11-13 years)
healthcare visits are for preventive care making it difficult to begin vaccinating the recommended target population (Herzog, Huh, Downs, Smith, & Monk, 2008).

Vaccines designed to reduce the incidence of HPV are likely to have significant health benefits by decreasing morbidity and mortality associated with cervical cancer. Savings in healthcare costs, including treatments for genital warts, precancerous cervical lesions, and cervical cancer would be considerable (Gonik, 2006). In the past, vaccine availability has not always led to widespread use or acceptance. The success of the effectiveness of the vaccine depends on its acceptance by individuals at risk for HPV. In the case of minors, the success of the vaccine depends on parents’ decision to have their adolescent daughters vaccinated.

Parental Intentions and Vaccines

Childhood and adolescent immunizations have a protective intent, and as protectors of their children’s health status, parents are the primary gatekeepers for these immunizations. Parents must balance protecting their children from possible disease in the future with potential side effects or long term problems as a result of immunizations (Sturm, Mays, & Zimet, 2005). Some understanding of issues associated with HPV vaccine intention can be drawn from data about intentions to receive other vaccines. Studies of existing vaccines both compulsory and non-compulsory have shown a relatively low vaccination rate among individuals most at risk for certain conditions (Zimit, Mays, & Fortenberry, 2000). For example, of all target groups for the influenza vaccine (73.1% of the U.S. population), only 32.3% received the vaccine (Nichol, 2006). In 2005, the CDC reported that vaccine rates for compulsory childhood immunizations did not meet the goal of 80% coverage. This finding suggests that even when vaccines are
compulsory, parents make their own decisions about whether or not they intend to immunize their children (Gellin, Maribach, & Marcuse, 2000).

Parents will need to decide whether or not they intend to have their daughters immunized against HPV since the vaccine is non-compulsory and recommended for the pre-adolescent and adolescent population. The most recent vaccine data indicate that 25.1% of female adolescents initiated the vaccine series in 2007 (CDC, 2008). This represents nearly five million doses of HPV vaccine that have been given in the U.S. as of March, 2007. In 2009, no differences were found in coverage by race or ethnicity for adolescents between the ages of 13 and 17 years who received one dose of the HPV vaccine. However, among adolescents in the same age group, completion of the vaccine series was lower among Blacks (23.1%) compared with Whites (29.3%) (CDC, 2009).

Several factors associated with parental intent to vaccinate their child are cited in the literature. Concern about vaccine safety was the most important factor reported by parents who intended to decline vaccination for their children (Salmon et al., 2005). Salmon and colleagues (2005) also found that low levels of perceived susceptibility to a disease, low perceived vaccine efficacy, and concern that children get more immunizations than are good for them were negatively associated with intent to vaccinate. Some parents and groups view compulsory vaccination as an infringement on individual rights and, therefore oppose childhood vaccines (Ross & Aspinwall, 1997).

Parental attitude is significantly associated with intent to vaccinate. Parents who demonstrate a positive attitude toward vaccinating their children indicate a strong desire to protect their children by preventing infection or disease (Mays, Sturm, & Zimet, 2005).
More positive attitudes about vaccines were held by parents who attributed greater influence to their pediatrician’s opinion than by parents whose providers’ opinion was thought to be less influential (Sturm, Mays, & Zimit, 2005).

A significant number of research studies examined negative attitudes of parents toward vaccines. Parents were more likely to have a negative attitude toward vaccines if they did not perceive vaccine preventable diseases severe enough to warrant preventive action, or if they did not perceive any particular benefit to their child’s health from the vaccination (Gellin, Maibach, & Marcuse, 2000). Many parents who lack first hand knowledge of vaccine preventable illnesses such as measles or polio are not likely to perceive such illnesses as an immediate threat to the health of their children (Kennedy, Brown, & Gust, 2005).

Studies of parental attitudes toward vaccines based on differences in race found that in general, Black parents are more likely to than White parents to have negative attitudes toward immunizations and their child’s healthcare provider, even when adjusting for socioeconomic status (Shui, Kennedy, Wooten, Schwartz, & Gust, 2005; Shui, Weintraub, & Gust, 2006). In particular, Black parents had specific concerns about vaccine ingredients and vaccine safety.

**HPV Vaccination Intention**

The HPV vaccine is different from other childhood vaccines because it prevents a disease that is almost never spread without sexual contact. A number of factors that influence HPV vaccine intention have been cited in the literature. Beliefs and attitudes are important antecedents to HPV vaccine intention (Waller, Marlow, & Wardle, 2006). For example, research has shown that positive attitudes towards HPV vaccine are the
strongest predictor of intentions to get the vaccine (Olgilvie et al., 2007). Moreover, attitudes about vaccine efficacy and concerns that vaccination could promote adolescent sexual activity have been found to influence parental intention to have their daughters vaccinated (Brewer & Fazekas, 2007; Sturm, Mays, & Zimit, 2005).

Although some studies of HPV vaccine intention have included Black women in their population sample, few studies have focused on within group variations in factors that influence Black parents’ intent to vaccinate their daughters with the HPV vaccine. Examination of these factors in the Black population is particularly important due to striking health care disparities between Blacks and Whites. Compared to Whites, Blacks have been found to have lower rates of Pap smears, higher rates of HPV infection, and higher cervical cancer rates than their White counterparts (Scarcici, Garces-Palacio, & Partridge, 2007). Research indicated a need for within-group examination of variations in health related beliefs among Blacks in order to allow for more efficient implementation of culturally tailored interventions (Beckjord & Klassen, 2008; Bogart & Thorburn, 2006; Brewster et al., 2007). According to Brewster (2007), although ethnic group comparisons have been essential to characterizing differences in health behaviors between Blacks and Whites, a better understanding of within-group variation in health behaviors is needed to develop more effective education programs for Blacks at increased risk for health related problems.

Attitudes and Beliefs Among Black Parents

The majority of parents are interested in protecting their children against diseases. Parental attitudes and concerns among Blacks and Whites are similar when it comes to maintaining the health of their children and reducing vaccine preventable illness. In
general, research has shown that both Black and White parents are concerned about vaccine safety, number of vaccines children receive, and vaccine ingredients (Shui, et al., 2006; Sturm, Mays, & Zimit, 2005). Moreover, research has indicated that, though the nature of attitudes about vaccines are similar among Black and White parents (e.g., preventive effects, safety, number of vaccines), Black parents are significantly more likely to report high-level concern and have more negative attitudes about vaccines than White parents (Prislin, et al., 1998; Shui, et al., 2006). Research also suggests that religious and mistrust beliefs more prevalent among Blacks may lead to more negative attitudes about vaccines in this population that may, in turn, lead to negative HPV vaccine intentions (Moutsiakis & Chin, 2007; Peters, Aroian, & Flack, 2006).

Spirituality and religion are important aspects of African American culture, and many of the beliefs and perceptions of Blacks regarding health may be related to religion. For example, strong religious faith among Blacks was found to have a significant effect on their health care practices and behaviors such as nutritional practices, exercise, and use of alcohol and tobacco (Blocker et al., 2006). According to Clark-Tasker (1993), many Blacks believe that illness may be due to a failure to live according to God’s will and an acceptance of fate and destiny. Clark-Tasker also notes that many Blacks believe that God is in control of their health and that healing can come only through prayer and faith in God. In fact, Swanson and colleagues (2004) note that the belief that “God will take care of me” summarizes the perspective in the Black community that no matter what they do, a greater force has more control. For example, one study revealed that women with strong religious beliefs, including belief in a supreme creator and a predestined life, were less likely to intend to engage in a healthy lifestyle (Drayton-White...
& Brooks, 2004). Attention to the cultural relevance and inclusion of spiritual and religious beliefs are noted as important constructs relative to understanding health seeking behaviors among Blacks (Gullatte, 2006). Thus, it was important to gain an understanding of the extent to which religious beliefs, HPV attitudes, and HPV intentions are interrelated among Black parents with adolescent daughters.

Historical mistrust of the healthcare system among Blacks in the U.S. has been well documented (Corbie-Smith, Thomas, Williams, & Moody-Ayres, 1999), and the Tuskegee Study of Untreated Syphilis in the Negro Male is commonly cited by Black study participants as a reason for concern and mistrust of the government and medical community (Scarinci, et al., 2007). Importantly, research has shown that Blacks are far more likely to mistrust their healthcare provider and government compared to Whites (Armstrong et al., 2008; Boulware et al., 2002; LeVeist, Nickerson, & Bowie, 2000; Whetten et al, 2006), and mistrust among Blacks may provide one explanation for racial differences in health behaviors (Boulware et al., 2002). It is plausible, then, that mistrust may represent a negative belief about HPV vaccine among some Blacks that may influence parental attitudes which, in turn, may influence their parental vaccine intention. For example, research has shown that mistrust of the medical community and government in the Black population is associated with a negative vaccine attitude that Black children are more likely to receive lower quality shots than White children (Cheatham, Barksdale, & Rodgers, 2007; Scarinci et al., 2007; Shui et al., 2005). Thus, although the nature of parental attitudes may not differ significantly among Blacks and Whites, mistrust beliefs prevalent among Black parents may lead to their negative
vaccine attitudes which may, in turn, have a negative impact on their intentions to have their daughters vaccinated with HPV vaccine.

The purpose of this study was to examine the relationships among beliefs, attitudes, and HPV vaccine intentions among Black parents. Study results will help gain a greater understanding of the extent to which beliefs prevalent among Blacks may influence their HPV vaccine attitudes and intentions. Data from this study may also contribute to the development of targeted interventions designed to increase dissemination of the HPV vaccine among this high risk population.

Statement of the Problem

What are the relationships among beliefs, attitudes, and HPV vaccine intentions among Black parents?

Subproblems

1. Is there a relationship between attitudes and HPV vaccine intentions among Black parents?
2. Is there a relationship between behavioral beliefs and attitudes among Black parents?
3. Do attitudes mediate the relationship between behavioral beliefs and HPV vaccine intention among Black parents?

Definition of Terms

Intention was theoretically defined as an indication of a person’s readiness to perform a certain behavior (Ajzen, 1991). Intention was operationally defined a subject’s score on the HPV Intention Scale.
A behavioral belief was theoretically defined as a person’s perception regarding the consequences of a behavior and the evaluation of those consequences (Ajzen, 2006). Behavioral belief was operationally defined as the subject’s score on the Religious Beliefs and Trust Beliefs Scales.

Attitude toward a behavior was conceptually defined as a person’s overall evaluation of performing the behavior in question (Ajzen, 2006). Attitude toward a behavior was operationally defined as the subject’s score on the Attitudes Scale.

Black parents with adolescent daughters were defined as individuals who self-identify as Black and have daughters between the ages of 9 and 17 years.

**Delimitations**

The literature indicates that Blacks have higher cervical cancer rates, lower rates of Pap smears, and higher rates of HPV infection than their White counterparts (Scarcici, Garces-Palacio, & Partridge, 2007). The HPV vaccine has been approved for use in females between the ages of 9 and 26. The CDC’s Advisory Committee on Immunization Practices (ACIP) (2007) recommends routine vaccination of 11-12 year old girls and a catch-up vaccination for females 13-26 years of age. Therefore, the sample in this study included mothers and/or fathers who self-identified as Black and had daughters between the ages of 9 and 17. In addition, the sample subjects were able to read, write, speak, and understand English.

**Significance of the Study**

The HPV vaccine, which has been shown to be highly effective in preventing precancerous cervical lesions caused by HPV type 6 and 11, could have a tremendous public health impact (Harper, Franco, & Wheeler, 2006). The vaccine could prevent
70% of cervical cancer in women as well as cancers of the vulva, vagina, and anus, which are not as common, but can be just as devastating. The HPV 6, 11, 16, and 18 vaccine could prevent over 90% of genital warts and respiratory papillomas (Kahn, 2007).

Researchers have predicted the possible public health impact of the HPV vaccine in terms of disease reduction and cost-effectiveness. Elbasha, Dashbach, and Insigna (2007) found that, within an organized cervical cancer screening program, vaccinating girls before age 12 would be cost-effective relative to other commonly accepted healthcare programs, as would adding a female catch-up vaccination. Vaccinating girls before age 12 could reduce cervical warts by 83% and cervical cancer by 78%.

Widespread HPV vaccination can reduce the cost, morbidity, and mortality associated with cervical cancer (Mahdavi & Monk, 2005). Although the incidence of cervical cancer has declined over the past three decades, it remains a serious health threat, especially for the Hispanic and Black populations. In addition, the cervical cancer mortality rate for Black women continues to be more than twice the mortality rate for White women (CDC, 2005). Research indicates that Black women have a higher rate of HPV infection and lower rates of Pap screening than White women which is likely driven by health system inadequacies such as insufficient access to medical care and lack of effective health education (Kahn, Lan, & Kahn, 2007). The availability of prophylactic HPV vaccines has the potential to narrow these disparities, but only if women and parents with adolescent girls in all racial and ethnic
groups accept the HPV vaccine, have access to the vaccine, and can afford the three vaccine series.

An estimated 35 million adolescents in the U.S. do not receive all recommended vaccines despite existing national adolescent immunization recommendations (Schaffner, Brooks, & Jenson, 2005). Most states recognize the need for parental consent for vaccination of minors, therefore examination of factors influencing HPV vaccine intention among parents with adolescent females may be key in fostering positive attitudes toward the vaccine. Empirical literature indicates that parental intention to have their children vaccinated is associated with factors such as knowledge of vaccines, attitude toward vaccination, age of the child, and importance of vaccination to others (Brewer & Fazekas, 2007; Vetter & Geller, 2007).

Race and ethnicity were also found to be associated with likelihood of vaccinating one’s daughter (Kahn, 2007). A study by Constantine and Jerman (2007) found that compared to other parents, Asian-Americans and African-Americans were the least likely to agree to vaccinate their daughters before thirteen years of age. In addition, historical mistrust of government agencies and the healthcare system among Blacks may prevent this at-risk population from becoming vaccinated against HPV. Efforts to examine beliefs, attitudes, and behaviors concerning parental intention to vaccinate their daughters in the Black population may help reduce opposition to this voluntary immunization and increase vaccine rates.

Findings from this study can be used to develop culturally sensitive interventions designed to address parental health beliefs, attitudes, and intentions which may prove successful in increasing interest in the HPV vaccine. Additionally, nurses can utilize
the findings to create educational initiatives targeted towards Black parents in order to dispel negative vaccine beliefs and foster positive attitudes towards vaccination. Thus, informational programs can be tailored to parental attitudes and beliefs.

Knowledge generated from the study may also provide guidance for community-based strategies to ensure access to vaccination among girls in racial or ethnic groups at relatively high risk for cervical cancer. Strategies for the development of interventions involving the efforts of nurses, clinicians, educators, and policy makers are needed to realize the potential public health impact of HPV vaccines.

The need to understand relevant factors associated with parental intent to have their daughters vaccinated is essential to the dissemination of HPV preventive immunization among Blacks. There was a paucity of studies that have examined the relationships between these variables and parental vaccine intention among Black parents with adolescent daughters. Exploration of these theoretical relationships provided an increased understanding of the factors that influenced Black parents’ intentions to engage or not engage in certain HPV-related health behaviors.
Chapter 2

Review of the Literature

This chapter presents the theoretical and empirical literature as it relates to determinants of Black parent's intention to have their daughters receive the HPV vaccine. Specific determinants consist of constructs from the Theory of Planned Behavior (TPB) and include behavioral intentions, attitudes and beliefs, normative beliefs and subjective norms, and perceived behavioral control. Theoretical and empirical literatures relevant to these relationships are presented in this chapter. The first section presents a discussion of the Theory of Planned Behavior, the theoretical framework that will guide the study. Secondly, a review of empirical literature that supports the relationships among Theory of Planned Behavior concepts that were tested in this study is presented. Lastly, gaps in the empirical literature are identified, the theoretical rationales for the research questions are summarized, and the study hypotheses are outlined.

The Theory of Planned Behavior

Theory and previous empirical research guide the selection of concepts and variables associated with intention. Theorists posit that intention to perform a behavior is a powerful predictor of actual behavior (Ajzen, 1991; Ajzen & Fishbein, 1980). The stronger a person’s intention to perform a particular behavior, the more successful they are expected to be in carrying out that behavior.

Theorists have also acknowledged the importance of behavioral intentions in predicting behavior. The Theory of Interpersonal Behavior (Trandis, 1980) proposes that intentions are the immediate antecedents of behavior. In addition, behavior is partly a function of habitual responses and partly a function of situational constraints and
conditions. Pender (1996) uses the term “commitment to action” in the Health Promotion Model to describe a concept similar to intentionality. Commitment to action refers to one’s intention to carry out a specific action at a given time, and identification of definitive strategies for eliciting, carrying out, and reinforcing behavior. The Health Belief Model focuses on beliefs about illness and the likelihood of taking preventative health actions. It is a value-expectancy theory in which the value is the desire to get well or avoid illness and the expectation is the belief that a specific health action will prevent illness (Janz & Becker, 1984). Although these models can be used to measure intention, they do not stipulate examination of “within group” behavioral intentions and its antecedent factors. In addition, instruments used to test these models do not include items that are specific to particular populations and may not explore cultural beliefs and norms that may have an important effect on intentions.

The TPB (Ajzen, 1991) is a particularly efficient model to explain behavioral intention and has been used in studies to predict and understand intentions, behaviors, and outcomes of health related behaviors (Armitage & Connor, 2001). Theory concepts and propositions allow for the exploration of beliefs and attitudes common among particular racial or ethnic groups as well as the development of measures of beliefs and attitudes that are culturally sensitive and specific.

The TPB suggests that a person’s behavior is determined by his or her intention to perform a certain behavior and that this intention is, in turn, a function of attitude toward the behavior, subjective norm, and the individual’s perceived behavioral control. The TPB proposes a causal chain that connects behavioral beliefs, normative beliefs, and
control beliefs to behavioral intention and actual behavior via attitude, subjective norms, and perceived behavioral control (Montano & Kasprzyk, 2002).

Proponents of the TPB theorize that the most important direct determinant of behavior is behavioral intent, therefore the stronger an individual’s intention to perform a behavior, the more likely he or she is to report success in performing that behavior.

**Behavioral Intentions**

Intentions are a function of salient beliefs and information about the likelihood that performing a behavior will lead to a specific outcome, and are considered to be the immediate antecedent of behavior. They are an indication of a person’s readiness to perform a certain behavior and are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert in order to perform the behavior (Ajzen, 1991, p.181).

Individuals intend to perform a behavior when they evaluate it positively, experience the social expectation to adopt a given behavior, and believe they have the means and opportunity to do so (Walsh, Edwards, & Frasier, 2008). There is not always a perfect relationship between intention and behavior, but barring unforeseen events, individuals will usually act in accordance with their intention. The relative importance of intentions in predicting behavior may vary depending on the situation and the behavior.

**Parental Intentions**

Parental intentions play a crucial role in behaviors that affect their children’s lives. In an ideal world, parents are protectors of their children, and therefore are the gatekeepers for health care decisions including immunizations. They intend to engage in
certain behaviors in order to protect their children from potential diseases or other threats to their welfare or safety (Sturm, Mays, & Zimit, 2005). According to the TBP, health related behaviors such as immunization are planned behaviors which are preceded by parental beliefs about taking a particular action. Parents form their attitudes about health practices based on possible consequences of a behavior. In addition, parents develop a sense of their control over a behavior and consider the expectation of others to perform a particular behavior on behalf of their children, which in turn influences intention to perform the behavior (Prislin, Dyer, Blakely, & Johnson, 1998).

Intention to perform a certain behavior has been theorized to be a strong predictor of actual behavior in adults (Godin & Kok, 1996). Studies indicate that strong intention to participate in health related behaviors in adults is associated with strong intention to ensure that their children also participate in health related behaviors (Kahn, Rosenthal, Hamann, & Bernstein, 2003).

Antecedents to Behavioral Intention

The TPB suggests that in combination, attitude toward a behavior, subjective norm, and perceived behavioral control lead to the formation of behavioral intention. The theory postulates that behavior is a function of beliefs that are relevant to a given behavior. Although people can hold a number of beliefs about a given behavior, they can only focus on a small number at a time (Ajzen, 1991).

Behavioral Beliefs and Attitude

According to the TBP a behavioral belief is a person’s perception regarding the consequences of a behavior and the evaluation of those consequences (Ajzen, 2006). Beliefs about a behavior are associated with certain attributes, characteristics, or events.
Each belief links a behavior to an outcome or attribute. Since these attributes are already valued positively or negatively, an attitude toward the behavior develops simultaneously. A person who has strong beliefs that a positively valued outcome will result from performing a behavior, will have a positive attitude toward the behavior (Doll & Ajzen, 1992).

An attitude toward a behavior is a person’s overall evaluation of performing the behavior in question (Ajzen, 2006) and is determined by individuals’ beliefs about outcomes or attributes of performing a certain behavior. Generally, the more favorable the attitude towards a behavior, the stronger the intention to perform the behavior becomes. Once an attitude is formed, it remains in an individual’s memory, and depending on the behavior in question, it may have an influence on that behavior (Fishbein, 2008).

Normative Beliefs and Subjective Norms

Normative beliefs involve the likelihood that specific individuals or groups (referents) approve or disapprove of performing a certain behavior (Ajzen, 1991). This perceived social pressure is theorized to increase based on the extent to which important referent individuals with whom the individual is motivated to comply are seen as approving of the behavior (Doll & Ajzen, 1992).

Subjective norm is the perceived social pressure to perform or not perform the behavior (Ajzen, 1991, p. 189). It is theorized that the subjective norm is determined by the entire group of normative beliefs about the expectations of salient referent individuals, in other words, perceived general social pressure (Ajzen, 1991). Individuals
will intend to perform certain behaviors when they perceive that important others, such as family members, close friends, or healthcare providers think they should.

**Control Beliefs and Perceived Behavioral Control**

Control beliefs are the perceived presence of factors that may facilitate or impede performance of a behavior, and these beliefs deal with the presence or absence of necessary resources and opportunities (Ajzen, 1991). They may be based on past experience with the behavior, but may be influenced by the experience of important individuals, as well as other factors that raise or lower the perceived difficulty of performing a particular behavior (Doll & Ajzen, 1992).

Perceived behavioral control refers to individuals’ perceptions of their ability to perform a certain behavior, and directly influences both intention and behavior (Ajzen, 1991). The importance of intention and perceived behavioral control in predicting behavior varies across situations and behaviors. When the behavior is under the complete control of an individual, intention alone may be enough to predict behavior, however perceived behavioral control allows for prediction of behaviors that are not under complete volitional control (Doll & Ajzen, 1992).

Perceived behavioral control reflects personal beliefs about the ease or difficulty of performing a particular behavior. It includes external factors such as availability of money, time, or social support, and internal factors such as information, ability, and skill sets (Godin & Kok, 1996). It is theorized that a person will expend more effort to perform a certain behavior when his or her perceived behavioral control is high. The TPB postulates that perceived behavioral control is an independent determinant of behavioral
intention along with subjective norm and attitude toward the behavior (Montano & Kasprzyk, 2002).

Mediating Role of Attitudes

According to the TPB, it is possible to predict an individual’s attitude toward a behavior from the weighted sum of his beliefs about performing the behavior. Since attitude toward a behavior is a determinant of intention, theoretically it is possible to predict intention indirectly from behavioral beliefs through attitudes. Several conditions must be met in order to establish the mediating role of attitudes on the relationship between behavioral beliefs and behavioral intention. First, it must be shown that behavioral beliefs predict attitude toward the behavior and second, the attitude toward the behavior must be shown to predict intention (Ajzen & Fishbein, 1980). This premise is consistent with Baron and Kenny’s mediation framework (1986) that stipulates the independent variable must predict the mediator and the dependent variable in order to test a mediation model.

Attitudes, subjective norms, and perceived behavioral control along with their relevant beliefs are the building blocks of the Theory of Planned Behavior. Each of these behavioral determinants have been found useful in predicting intention and behavior, however this study only focused on behavioral beliefs and attitudes. Specifically, the relationship between attitudes and parental intentions, behavioral beliefs and attitudes, and attitudes as a mediator of behavioral beliefs and intentions were examined in this study.

Empirical Support for Parental Intention to Vaccinate their Child and Theory of Planned
Behavior Antecedents

The TPB has been used in studies to predict and understand health related behaviors. The efficiency of the model was determined to be useful for explaining behavioral intention across health-related behavior categories including exercise, sexual behaviors, diet, parental health-related intentions, and vaccination behaviors (Armitage & Connor, 2001; Godin & Kok, 1996; Prislin et al., 1998).

Attitudes and Parental Intention to Vaccinate

Several factors associated with parental intent to vaccinate their child are cited in the literature and a number of studies have shown that parents with a positive attitude about vaccines are more likely to intend to have their children vaccinated. In a study that included 1350 parents of teen-aged daughters, Ogilvie and colleagues (2007) examined predictors of parental intentions to have their daughter receive the HPV vaccine. The racial demographics of the sample were Caucasian 83.4%, Aboriginal 2.3%, and other 14.3%. Study findings revealed that the strongest predictor of parental intention to have their daughters vaccinated was parental attitude towards vaccines in general and the HPV vaccine in particular. Results indicated that 73.8% (95% CI 71.5% - 76.1%) of parents in the sample intended to have their daughters vaccinated against HPV. In multivariate modeling, the odds of intending to vaccinate their daughters were 10 times higher in parents with positive attitudes toward vaccines (odds ratio (OR) 9.9, 95% CI 4.7 – 21.1) compared to parents with negative attitudes toward vaccines (Ogilvie et al., 2007).

Another study described vaccine intention and parental attitude toward a hypothetical herpes simplex virus 2 vaccine (Liddon, Pulley, Cockerham, Lueschen, Vermund, & Hook, 2005). The terms vaccine acceptance and vaccine intention measured
the same concept in this study. The sample consisted of 315 parents of at least one child under age 18 and was racially categorized as 72% White and 28% non-white. Study findings indicated that the majority of parents (69%) intended to have their children immunized against genital herpes. In addition, parents who intended to have their children vaccinated had significantly higher scores on the positive attitude towards vaccination scale compared to parents who did not intend to have their children vaccinated ($t = 2.12, p < .05$). Multivariate analysis revealed that parents with a positive attitude toward immunization were two and one-half times more likely to intend to have their children immunized compared to parents with a negative attitude towards immunization. Similarly, parents who believed that sexually transmitted disease (STD) vaccines would decrease STD rates were 1.6 times more likely to intend to have their children immunized compared to parents who did not believe that STD vaccines would be effective.

In a study by Marlow, Waller, and Wardle (2007), a sample of 684 mothers of 8 to 14 year old daughters were surveyed to determine parental attitudes toward pre-pubertal HPV vaccination. The racial demographics of the sample were White 92.6%, non-White 6.3%, and 1.2% did not wish to answer. Findings revealed that mothers who intended to have their daughters vaccinated against HPV had more positive attitudes as measured by three HPV specific positive item statements: I wish the vaccine had been around when I was young ($OR = 5.21; 95\% CI = 3.75-7.24; p = <0.001$), I would be glad if the vaccine meant an end to smears ($OR = 1.89; 95\% CI = 1.52-2.35; p = <0.001$), and I would be glad if the vaccine was against genital warts ($OR = 2.78; CI = 2.01-3.86; p = <0.001$). On the other hand, negative vaccine attitudes were significantly associated with
concerns about giving too many vaccines (OR = 0.43; 95% CI = 0.28-0.68) and vaccine side effects (OR = 0.48; 95% CI = 0.31-0.73). Specifically, mothers who had concerns about their children receiving too many vaccines and about vaccine side effects were less likely to intend to have their daughters vaccinated against HPV compared to mothers who did not have these concerns.

A study of 522 California parents with a racial composition of 38% Hispanic, 40% White, 7% Black, 7% Asian, and 5% other, was conducted to determine whether parents intended to have their adolescent daughters vaccinated against HPV (Constantine & Jerman, 2007). Quantitative findings revealed that Black parents were least likely (OR = 0.46; \( p =.03 \)) to have their daughters receive the HPV vaccine before the age of 13 as compared to Hispanic, White, and Asian parents. Qualitative findings indicate that parents who had positive attitudes about vaccine efficacy, pragmatic prevention, and health and safety also indicated that they intended to have their daughter vaccinated against HPV. On the other hand, parents who expressed negative attitudes about the vaccine’s effect on sexual behavior and potential vaccine side effects were more likely to indicate that they did not intend to have their daughters receive the HPV vaccine.

Walsh, Edwards, and Fraser (2008) examined attitudes, subjective norms, and parental intention to reduced childhood fever with medications in a sample of 391 parents of children between 6 months and 5 years of age. The racial composition of the study sample was not reported. Attitudes toward intention to reduce fever with medications were based on three items derived from a qualitative study conducted to identify parents’ attitudes, subjective norms, and intentions. Parental attitudes emerged as one of the
strongest influences of intention ($\beta = 0.55, \ p < .001$), followed by subjective norms ($\beta = 0.36, p < .001$), accounting for 69% of the total variance in intention.

Two studies focused on HPV vaccine acceptability among rural Southern women. Vaccine acceptability was conceptualized in both studies as willingness to pay for the vaccine and intentions to vaccinate if it were free. Fazekas, Brewer, and Smith (2008) conducted a study with a sample consisting of 62% Black and 32% White respondents and found that Black women were less likely to get themselves or their daughters vaccinated against HPV. In a similar study of women in rural areas, findings revealed that in a sample consisting of 62% Blacks and 32% Whites, women were more likely to intend to vaccinate their daughters than themselves when the vaccine was described as preventing genital warts (OR = 3.6; 95% CI: 2.3 - 5.6) (Sperber, Brewer, & Smith, 2008). While a large percentage of the samples were Black in these two studies, the comparison of vaccine acceptability and intention between Blacks and Whites assumes that these constructs are homogenous within racial groups. There was a need to study the extent to which parental intention varies within racial groups and factors that contribute to within group variation. In addition, both studies included participants without children as well as those with children in the sample.

Finally, Cates and colleagues (2009) sought to identify racial differences in attitudes about the HPV vaccine that may influence parental intent to have their daughters receive the vaccine. In a population of rural Southern women, Black respondents ($n = 91$) had lower intentions scores (mean 4.1; SD 1.2) than White respondents ($n = 47$; mean 4.6; SD 0.8), indicating that Black parents were less likely to intend to have their daughters receive the HPV vaccine than White parents. In addition, attitude scores
indicated that fewer Black parents (mean 4.1; SD 1.1) agreed that vaccines are beneficial than White parents (mean 4.5; SD 0.6), and more Black parents (mean 2.9; SD 0.9) indicated that vaccines are unnecessary than White parents (mean 2.5; SD 0.7). The authors note the possibility of a relationship between lower trust in traditional health care practices among Blacks, misperceptions about vaccine safety in the Black population, and low vaccine intentions, but the relationships among these variables was not examined.

In summary, six studies examined HPV vaccine intention among parents of adolescent daughters, one examined general vaccine intention, and one explored parental intention to treat a medical condition. In these studies, positive attitudes were a significant predictor of intentions. Although some studies have examined the relationship between attitudes and intention among the Black population, study findings indicated that attitudes about vaccines may differ among Blacks compared to other races, and warranted further within-group investigations of factors that may influence attitudes and intentions in this population.

While the racial composition of these studies indicated diverse samples, the percentage of Black parents included in these studies was not clear. Additionally, many of the studies had a large sample size however, minority groups including Blacks were not adequately represented. Although instruments used to measure attitudes were included in most studies, no studies indicated that these attitude measures had been pretested in the Black population. Thus, it was not clear if the items in the measures used in these studies tap a domain of attitudes that may be distinctly relevant to Blacks. These areas of methodological weakness warranted further study of factors that influenced
vaccine attitudes and intention in the Black population and the use of valid and reliable instruments to measure these variables.

**Behavioral Beliefs and Attitude**

According to the TPB, behavioral beliefs predict attitudes about a behavior. Several studies examined the relationship between behavioral beliefs about health promoting behaviors and attitudes toward health promoting behaviors. Specifically, a number of studies have explored distinct beliefs prevalent among Blacks including conspiracy beliefs, religious beliefs, and mistrust of the healthcare system. These beliefs may influence Black parental attitudes towards HPV vaccine intentions.

In a study of 71 Black adults the relationship between HIV/AIDS treatment conspiracy beliefs and condom attitudes was examined (Bogart & Bird, 2003). Findings suggest that belief in an HIV/AIDS treatment government conspiracy was related to positive attitudes about using condoms ($r = 0.25; p < .05$). That is, individuals who do not trust new treatments for HIV may be motivated to use condoms to avoid those treatments or any contact with healthcare providers. Conspiratorial beliefs among Blacks may influence their beliefs related to the HPV vaccine which, in turn, may produce negative attitudes, resulting in low rates of immunization.

A qualitative study of 53 Black mothers with at least one child between the ages of 19 and 35 months examined factors influencing attitudes toward immunizations and vaccine intentions (Shui, Kennedy, Wooten, Schwartz, & Gust, 2005). Mistrust of the medical community and government were prevalent themes among study participants. Attitudes of mistrust stemmed from beliefs that vaccines were unsafe and that their children would likely be used unknowingly in government-sponsored vaccine
experiments. In addition, Black mothers believed that their children were likely to receive lower quality shots than White children. Mothers who expressed attitudes of mistrust were less likely to have their children immunized than mothers who did not express attitudes of mistrust.

Similarly, a second qualitative study explored the beliefs of Blacks regarding hypertension-preventive self-care behaviors (Peters, Arolan, & Flack, 2006). The sample included 34 Black adults between 26 and 60 years of age. The overall aim of the focus group was to gain an understanding of salient behavioral beliefs regarding hypertension and intention to engage in health-related behaviors. One major theme that emerged based on focus group interviews was that, although participants held positive beliefs about health behaviors, their intention to engage in these behaviors was influenced by a circle of culture, which referred to participant’s belief that Black attitudes about health behaviors are influenced by a collectively shared history that is passed from generation to generation (p.842). One negative belief among Blacks that emerged was a distrust of the healthcare system which older participants described as having a strong influence on their health behavior intentions as well as intentions of their children and grandchildren.

The relationship between religious beliefs, attitudes and intention to engage in health promoting behaviors was explored in a qualitative study of prostate cancer prevention and screening behaviors among 29 African-American men (Blocker et al., 2006). This qualitative study revealed diverse beliefs about the influence of religion on intention to participate in health promotion practices such as prostate screening. Men who expressed the belief that the body is God’s temple and should be cared for properly had positive attitudes about health promotion behaviors. On the other hand, men who did not
believe that health or illness was God’s will were less likely to express an intention to engage in health promoting behaviors.

In another qualitative study by Drayton-Brooks and White (2004), beliefs, attitudes, intentions, and health promoting behavior were explored in a sample of 26 African-American women. Study findings revealed that women with strong religious beliefs, including belief in a supreme creator and a predestined life, were less likely to intend to engage in a healthy lifestyle. Respondents with these beliefs accepted their existing health status and did not intend to commit to behavioral change. These findings underscored a need to examine religious beliefs of Black parents and the extent to which these beliefs influenced attitudes about HPV vaccines and intentions to have their daughter receive the vaccine.

In summary, in three studies researchers examined the relationship between behavioral beliefs and attitudes related to health promoting behaviors. In one study researchers examined the relationship among beliefs and attitudes and immunization rates, and one explored conspiracy beliefs and condom attitudes among Blacks. Few studies examining behavioral beliefs as predictors of attitudes among Blacks were found. However findings from four qualitative studies suggested that particular beliefs among Blacks, for example, conspiracy beliefs, religious beliefs, and beliefs of mistrust in the healthcare system, may have affected their attitudes toward health promoting behaviors. In these studies, the Black participants indicated that these beliefs had a negative effect on their behavioral intention. It was therefore plausible that religious and healthcare system mistrust beliefs that are common among Black parents may have affected their attitudes about HPV vaccine and, in turn, their intentions to get their daughters
vaccinated. Clearly, it was important to gain a further understanding of the relationships among HPV beliefs, attitudes, and intentions in Black parents.

*Attitude as a Mediator of Beliefs and Behavioral Intention*

A review of the literature found no studies that tested attitudes as a mediator of the relationship between beliefs and intention. However, several studies tested whether attitudes mediate the relationship between beliefs and behavior.

Bogart and Thorburn (2005) tested the mediator role of condom related attitudes in the relationship between HIV conspiracy beliefs and condom use in a sample of 500 Blacks. Condom use was measured by calculating the percentage of times each respondent reported use of a condom when engaging in vaginal or anal intercourse. Condom use behavior was measured retrospectively, therefore intentions could not be examined. Results indicated that the relationship between HIV/AIDS conspiracy beliefs and condom use was decreased to non-significance when the condom use attitudes variable was included in the regression model (OR = 0.66, (CI = 0.39, 1.14, p > 0.10) and the relationship between condom attitudes and condom use remained significant (OR = 4.32, (CI = 2.14, 8.72, p < 0.001).

In a second study testing mediation, Prislin and colleagues (1998) examined how immunization related beliefs, attitudes, and perceived control mediated the relationship between sociodemographic characteristics and up-to-date immunizations in a sample of 4832 households with at least one child between the ages of 2 to 24 months. The racial distribution of the sample was not reported. Sociodemographic characteristics included ethnicity/race, enrollment in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and education level. Mediation analysis indicated that
beliefs, attitudes, and perceived control completely mediated the relationship between enrollment in WIC and up-to-date immunizations, suggesting that enrollment in WIC had a positive effect on beliefs, attitudes, and control over immunizations that, in turn, led to parents getting their children immunized.

In summary, attitudes as a mediator of beliefs and behaviors were examined in one study, and in one study researchers examined beliefs, attitudes and perceived behavioral control as mediators between sociodemographic characteristics and behavior. Although no studies testing the role of attitudes as a mediator of beliefs and behavioral intentions were found, propositions in the TPB stipulate a contingent relationship among beliefs, attitudes and intentions. These studies supported the proposition that attitudes may serve as an underlying mechanism for the relationship between beliefs and behavior, and therefore it was likely that attitudes may mediate the relationship between HPV beliefs and intentions in this study.

*Summary of Literature Review*

Although some studies of HPV vaccine intention have included Blacks, none have focused specifically on understanding distinct beliefs, attitudes, and intentions within this racial group. A focus on Black parents in this study was particularly important for the development of culturally sensitive and specific education and interventions to decrease the health care disparities between Blacks and Whites (Scarcici, Garces-Palacio, & Partridge, 2007). In addition, an understanding of particular attitudes and beliefs about HPV vaccine prevalent among Blacks was needed to gain an understanding of factors that influence HPV vaccine intentions in this population. The empirical literature suggested that a general lack of trust in the health care system among Black adults and
their specific lack of trust in vaccine safety and quality may negatively influence Black parents’ intentions to have their daughters receive the HPV vaccine. In addition, religious beliefs among many Black adults may also affect Black parents’ attitudes about HPV vaccine that may, in turn, affect their intention to have their daughters receive HPV vaccine.

Review of the empirical literature indicated that attitudes may act as a mediator between behavioral beliefs and behavior. Since behavioral intentions are an antecedent to behavior, it was plausible that attitudes may mediate the relationship between behavioral beliefs and behavioral intentions.

Antecedents to behavioral intention may vary as a function of the behavior and the population being considered. Behavioral intention may be driven by attitudes, norms, and/or perceived behavioral control. Furthermore, the development of interventions designed to modify behavioral intentions should be guided by a clear understanding of the relationships among intentions, beliefs, and attitudes within a population (Fishbein, 2008). Thus, a clear understanding of the relationship among Black parents’ HPV vaccine beliefs, attitudes, and intentions is an important step in developing interventions designed to reduce the disparity of cervical cancer rates in Black females. Therefore, the purpose of the study was to examine the relationship among Black parents’ beliefs, attitudes, and HPV vaccine intentions.

Theoretical Rationale

The Theory of Planned Behavior (TPB) (Ajzen, 1991) suggests that a person’s behavior is determined by his or her intention to perform a certain behavior and that this intention is, in turn, a function of attitude toward the behavior. Studies indicated that
parents with a positive attitude about vaccines were more likely to intend to have their children vaccinated ((Liddon et al., 2005; Marlow, Waller, & Wardle, 2007; Ogilvie et al., 2007).

Theory suggests that attitudes are determined by individuals’ beliefs about the consequences of performing a behavior. Immunization beliefs were found to be significant predictors of attitudes toward immunization (Gore et al., 1999). In addition, mistrust/conspiracy and religious beliefs prevalent among Blacks may influence Black parents’ intention to have their daughters vaccinated with HPV vaccine (Peters, Arolan, & Flack, 2006; Shui, Kennedy, Wooten, Schwartz, & Gust, 2005; Spurlock & Cullins, 2006).

According to the TPB, it is theoretically plausible that attitudes function as a mediator between behavioral beliefs and behavioral intentions (Ajzen & Fishbein, 1980). Several studies suggested that attitudes mediate the relationship between behavioral beliefs and behavior (Bogart & Thorburn, 2005; Preslin et al., 1998). Since behavioral intentions are the immediate antecedent to behavior, it is plausible that attitudes mediate the relationship between behavioral beliefs and behavioral intentions.

The following hypotheses were examined in Black parents with daughters between the ages of 9 and 17:

1. Parental vaccine attitudes are significantly related to vaccine intention.
2. Behavioral beliefs are significantly related to parental vaccine attitudes.
3. When parental vaccine attitudes are controlled for, the magnitude and significance of the relationship between behavioral beliefs and parental vaccine intention will diminish.
Figure 1. Theoretical Relationships Between TPB Concepts
Chapter 3

Methods

This chapter presents the research design for the study including the research setting, sample, sampling methods, instruments, data collection procedure, and data analysis. A descriptive correlational design was used to examine the relationship among beliefs, attitudes, and HPV vaccine intentions among Black parents.

Research Setting

Subjects were recruited from the Long Island Educational Opportunity Center (EOC) and Farmingdale State College (FSC). EOC is a program of the State University of New York (SUNY) offering free services to economically and educationally underserved adults. These services include college placement and career development, academic computer skills, business careers and technology, and a certified nurse assistant program. The program is offered at three separate locations on Long Island and each location offers six major programs of study. Participation is open to high school graduates of all ethnic origins, including individuals from historically disadvantaged populations. FSC is a coeducational public college located on Long Island and is part of the New York State University System. According to student enrollment demographics, approximately 700 Black students were enrolled in the Fall 2009 semester (FSC, 2009).

Sampling Method

All EOC program participants and FSC students who met the inclusion criteria were recruited for participation in the study. Study participants had to be Black parents with daughters between the ages of 9 and 17. In addition, subjects had to be able to read, write, speak and understand English. Eligible EOC participants were approached at the
beginning of a class designated by the program administrator to be part of the participants' major program of study. A schedule of classes was given to the principal investigator (PI) by the EOC administrator in order to ensure inclusion of all eligible program participants. Eligible persons who agreed to participate were asked to remain in class. Those not meeting the inclusion criteria were dismissed from class until all questionnaires were completed. Eligibility was determined by providing an explanation of the study and inclusion criteria to the entire class. Program participants who met the inclusion criteria and were willing to participate in the study remained in the class for a more detailed explanation. The PI explained the procedure for completion of the questionnaire and distributed an informational letter that included (a) an explanation of the study purpose and invitation to participate, (b) an assurance of anonymity and the participant's right to choose not to participate or to terminate participation at any time, (c) a summary of risks and benefits, (d) contact information for the Principal Investigator, Rutgers University IRB, and FSC IRB, and (e) instructions to complete the questionnaire and return it to the PI. This letter also indicated that completion of the questionnaire served as their consent to participate in the study. Any eligible participant who expressed a willingness to participate after reading the letter was asked to complete the demographic and HPV Beliefs, Attitudes and Intention Questionnaires.

A similar procedure was followed for subjects recruited from FSC. Subjects were recruited from programs within the School of Health Sciences. Students were approached at the beginning of a class designated by the Dean of the School of Health Sciences to be part of the students' major program of study. The schedule of these classes was given to the PI by the Dean's administrative assistant. Eligible persons who agreed to participate
were asked to remain in the class. Eligibility was determined by providing an explanation of the study and inclusion criteria to the entire class. Students who met the inclusion criteria and were willing to participate in the study remained in the class for a more detailed explanation. The PI explained the procedure for completion of the questionnaire and distributed an informational letter explaining the subjects’ rights as research participants. This letter also indicated that completion of the questionnaire served as their consent to participate in the study. Any eligible participant who expressed a willingness to participate after reading the letter was asked to complete the demographic form and HPV Beliefs, Attitudes and Intention Questionnaire.

Power analysis for correlational and regression analysis was conducted to determine sample size. Based on previous research, moderate effect size \( r = .30 \) was estimated for correlational analysis (Bogart & Bird, 2003; Gerend, Lee, & Shepherd, 2007; Zimet et al., 1997). Based on a power of .80, and an alpha level of .05, a sample size of 88 was needed for correlational analysis. For regression analysis a moderate effect size \( f^2 = .13 \) was estimated based on a review of previous studies (Bogart & Thorburn, 2005; Bogart & Thorburn, 2006; Fazekas, Brewer, & Smith, 2008; Zimit, Liao, & Fortenberry, 1997). Based on seven predictor variables, a sample size of 185 was needed for regression analysis. A sample size of 262 was recruited and was more than sufficient to achieve statistical power for correlational and regression analyses.

Instruments

Demographics Questionnaire

The following demographic data and participant characteristics were collected to describe the study sample: gender, age, highest educational level completed, household
income, religion, frequency of attendance at religious services, marital status, ages of
daughters, health insurance status, and knowledge of close friends or family members
having cervical cancer.

*HPV Beliefs, Attitudes, and Intentions Questionnaire*

No instrument measuring HPV beliefs, attitudes, and intentions in the Black
population was found, therefore an instrument was developed by the principal
investigator (PI) to measure these constructs based on Ajzen’s (2006) recommendations
and protocol.

**Elicitation Study**

In order to identify behavioral beliefs about vaccines among Black parents, an
elicitiation focus group study using open-ended interviews was conducted using three
separate groups with nine participants in each. A total of 27 Black parents who had
daughters between the ages of 9 and 17 were asked about their beliefs related to
advantages and disadvantages of the HPV vaccine, mistrust in the government and drug
companies, religious beliefs, and the role of fate in their health promoting behaviors.
Questions related to HPV knowledge and vaccine decision making were also included in
the interviews. Follow-up questions were used to encourage discussion and participants
were given the opportunity to raise any issues that had not been covered. The interviews
were audiotaped and transcribed verbatim. Qualitative content analysis of interview
transcripts was used to encode the data. The PI and the Chairperson read the transcripts
separately and identified and labeled vaccine belief themes that focused on advantages,
disadvantages, religious beliefs, fate beliefs, and drug company and government mistrust
beliefs.
Statements derived from the elicitation study resulted in 16 behavioral belief items. In addition, 10 attitude items and 3 intention items recommended by Azjen (2006) were used (see Table 2). The language in the items was slightly modified to reflect HPV attitudes and intentions.

Table 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Anchor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief Item Pairs</td>
<td></td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine will help prevent her</td>
<td>strongly disagree/</td>
</tr>
<tr>
<td>from getting cervical cancer in the future</td>
<td>strongly agree</td>
</tr>
<tr>
<td>Right now preventing my daughter from getting cervical cancer is:</td>
<td>not important/</td>
</tr>
<tr>
<td></td>
<td>very important</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine might lead her to</td>
<td>strongly disagree/</td>
</tr>
<tr>
<td>become more sexually active</td>
<td>strongly agree</td>
</tr>
<tr>
<td>Sexual activity among preteens is:</td>
<td>unacceptable/</td>
</tr>
<tr>
<td></td>
<td>acceptable</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine means that I allow</td>
<td>strongly disagree/</td>
</tr>
<tr>
<td>her to be a lab rat for drug companies</td>
<td>strongly agree</td>
</tr>
<tr>
<td>Being a lab rat for drug companies is:</td>
<td>extremely undesirable/</td>
</tr>
<tr>
<td></td>
<td>extremely desirable</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine may lead to reactions</td>
<td>strongly disagree/</td>
</tr>
<tr>
<td>or side effects from the vaccine</td>
<td>strongly agree</td>
</tr>
<tr>
<td>Reactions or side effects from the vaccine are:</td>
<td>extremely unacceptable/</td>
</tr>
<tr>
<td></td>
<td>extremely acceptable</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine means that I am</td>
<td>strongly disagree/</td>
</tr>
<tr>
<td>allowing God to work through doctors to prevent illness</td>
<td>strongly agree</td>
</tr>
<tr>
<td>Allowing God to work through doctors to prevent illness is:</td>
<td>not important/</td>
</tr>
<tr>
<td></td>
<td>very important</td>
</tr>
</tbody>
</table>
Getting my daughter vaccinated with HPV vaccine is not necessary because health and illness are determined by God’s will. Getting my daughter vaccinated with HPV vaccine means that I trust the drug company that makes the vaccine. Getting my daughter vaccinated with HPV vaccine means I trust that the government has told people everything about the vaccine.

God’s will has an effect on the extent to which a person is healthy or ill. Trusting the drug company that makes the HPV vaccine is: Trusting that the government has told people everything about the HPV vaccine is:

### Intention Items

I intend to have my daughter vaccinated with the HPV vaccine. I will try to have my daughter vaccinated with the HPV vaccine. I plan on having my daughter vaccinated with the HPV vaccine.

### Attitude Items

Having my daughter vaccinated with HPV vaccine is:

<table>
<thead>
<tr>
<th>Instrumental Anchors</th>
<th>Experiential Anchors</th>
<th>Overall Anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td>valuable/worthless</td>
<td>pleasant/unpleasant</td>
<td>good/bad</td>
</tr>
<tr>
<td>harmful/beneficial</td>
<td>unhealthy/healthy</td>
<td></td>
</tr>
<tr>
<td>useful/useless</td>
<td>dangerous/safe</td>
<td></td>
</tr>
<tr>
<td>advantageous/not advantageous</td>
<td>responsible/not responsible</td>
<td></td>
</tr>
<tr>
<td>not important/important</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The scaling procedure for each scale followed Ajzen’s recommendations (2006). For the 3 intention items, a 7-point visual analog scale with the adjective pairs extremely unlikely and extremely likely anchoring the lower and upper end of the scale,
respectively, is used. Since attitude towards a behavior is defined as a person's overall evaluation of performing the behavior in question, Azjen recommends that attitude item responses reflect attitudinal evaluations that are both instrumental and experiential in nature. Instrumental evaluation item responses on the Attitude Scale include the anchor adjective pairs such as valuable-worthless or harmful-beneficial, and experiential item responses include the anchor adjective pairs such as pleasant-unpleasant. In addition, adjective anchor pairs that capture overall evaluation, such as good-bad and useful-useless are also used. Similarly, a 7-point rating scale with adjective pair anchors is used for the beliefs items.

**Psychometric Testing Pilot Study**

**Sample**

A pilot study was conducted to evaluate the 16-item HPV Beliefs Scale, the ten-item Attitudes Scale, and the 3-item Intention Scale for their psychometric properties. A convenience sample of program participants from EOC and FSC consisting of 145 Black parents (19 males/126 females) with daughters between the ages of 9 and 17 was used for the pilot study. IRB approval was secured from Farmingdale State College and Rutgers University prior to data collection. A description of the study procedures and inclusion criteria were verbally described by the PI at the end of a class in their major program of study. Subjects who did not meet the inclusion criteria, or were unwilling to participate in the study were dismissed from class. Those subjects meeting the inclusion criteria and who were willing to participate in the study were given an informational letter explaining their rights as research participants. This letter also indicated that completion of the questionnaire would serve as their consent to participate in the study. Each participant
was then given a demographic form and the HPV Beliefs, Attitudes, and Intentions Questionnaire to complete. The PI remained in the room to answer any questions and collect the completed questionnaires.

Data Analysis

Nunnaly and Bernstein (1994) indicate that item analysis involves an assessment of how each item in a newly constructed instrument relates to the overall test performance of the instrument and thereby provides discrimination indices. The best items on any instrument are the most discriminating, less ambiguous, and tend to make individual differences on the final version of the instrument more reliable (Nunnaly & Bernstein, 1994). The use of a discrimination index for item analysis is suggested to determine the “best” items to use on the final version of a newly constructed instrument (Nunnaly & Bernstein, 1994). The discrimination index, that is, corrected item-to-total correlations, and factor analysis were used for item analysis and final item selection for the Beliefs, Attitudes, and Intention Scales. Items that did not correlate, that is, their item-to-total correlation was $r < .30$ were considered for deletion (Nunnaly & Bernstein, 1994). Cronbach’s alpha was used to assess internal consistency reliability for each scale, and factor analysis was used, in conjunction with the discrimination index, for item selection and to assess the scales’ construct validity.

Item analysis

Item-to-total correlations were examined for the Beliefs, Attitudes, and Intentions Scales. The construction of items for the assessment of behavioral beliefs entails pairing of items to assess a person’s belief strengths and an evaluation of the outcome of a particular belief (Azjen, 2006). An examination of item-to-total correlations for the 16
items (8 item pairs) revealed eight Belief Scale items (4 item pairs) with item-to-total correlations that ranged from 0.04 to 0.17 (see Table 3). The PI and Chairperson determined that, based on the literature (Davis et al., 2004; Mays, Sturm, & Zimit, 2004) the item pairs could be reflected in instrumental and experiential HPV Attitudes Scale items that measure parental attitudes regarding the extent to which getting their daughters vaccinated is beneficial, safe, and responsible. Moreover, the two “lab rat items could represent a belief that is conceptually distinct from the other items. The extent to which these items reflect relatively “pure” measures of a belief domain were evaluated further with factor analysis (Tabachnick & Fidell, 2007). All item-to-total correlations for the Attitudes and Intention Scales were above 0.30, and all items on theses scales were retained for factor analysis.

Table 3

<table>
<thead>
<tr>
<th>Item-Total Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief Scale Items</td>
</tr>
<tr>
<td>Vaccine prevents cervical cancer</td>
</tr>
<tr>
<td>Prevention of cervical cancer is important/not important</td>
</tr>
<tr>
<td>Vaccine might lead to becoming more sexually active</td>
</tr>
<tr>
<td>Sexual activity among preteens/teens unacceptable/acceptable</td>
</tr>
<tr>
<td>Allow daughter to be lab rat disagree/agree</td>
</tr>
<tr>
<td>Being a lab rat for drug companies is undesirable/desirable</td>
</tr>
<tr>
<td>Vaccine may lead to side effects</td>
</tr>
<tr>
<td>Vaccine side effects are unacceptable/acceptable</td>
</tr>
<tr>
<td>Vaccination means allowing God to work through doctors</td>
</tr>
<tr>
<td>Allowing God to work through doctors is not important/important</td>
</tr>
<tr>
<td>Health and illness determined by God’s will</td>
</tr>
<tr>
<td>God’s will affects health and illness agree/disagree</td>
</tr>
<tr>
<td>Trust drug company that makes vaccine</td>
</tr>
<tr>
<td>Trusting drug company is not important/important</td>
</tr>
<tr>
<td>Vaccinating means trusting the government</td>
</tr>
<tr>
<td>Trusting the government is not important/important</td>
</tr>
</tbody>
</table>
### Attitude Scale Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daughter vaccinated with HPV vaccine is harmful/beneficial</td>
<td>.863</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is good/bad</td>
<td>.903</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is worthless/valuable</td>
<td>.896</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is pleasant/unpleasant</td>
<td>.628</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is useful/useless</td>
<td>.910</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is unhealthy/healthy</td>
<td>.885</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is advantageous/not</td>
<td>.788</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is dangerous/safe</td>
<td>.897</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is not important/important</td>
<td>.897</td>
</tr>
<tr>
<td>Daughter vaccinated with HPV vaccine is responsible/not</td>
<td>.752</td>
</tr>
</tbody>
</table>

### Intention Scale Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intend to have daughter vaccinated with HPV vaccine</td>
<td>.987</td>
</tr>
<tr>
<td>Try to have daughter vaccinated with HPV vaccine</td>
<td>.990</td>
</tr>
<tr>
<td>Plan on having daughter vaccinated with HPV vaccine</td>
<td>.987</td>
</tr>
</tbody>
</table>

**Factor Analysis**

Principal Components factor analysis was used for further item analysis and evaluate the factor structure and initial construct validity of each scale. The dimensionality of items in each of the three scales was analyzed by examining the scree plot and the number of components with Eigenvalues greater than 1 (Tabachnick & Fidell, 2007).

The scree plot for the initial, unrotated factor solution indicated that the 16-item Beliefs Scale was multidimensional and was composed of five dimensions. A five-factor solution was rotated using the Varimax rotation procedure. The rotation solution yielded 5 factors with Eigenvalues greater than one that explained 66% of the variance in HPV vaccine beliefs. Of these, only two factors appeared clearly defined (loadings greater than .40) and conceptually distinct (Tabachnick & Fidell, 2007). One factor consisted of four items with excellent loading, i.e., loadings greater than .71, (Comry & Lee, 1992) and
pertained to religious beliefs about God’s work and God’s will. The second factor consisted of 4 items with excellent loadings and pertained to mistrust of drug companies and the government. The remaining eight items either loaded ambiguously on at least two factors, or loaded with other items that produced uninterpretable factors, or were poorly defined (i.e., factor loadings < .30) (see Table 4). These items included the eight items with poor discrimination indices (i.e., item-to-total correlations < .30). Since item and factor analysis indicated that these items did not discriminate well and were poorly defined, they were not selected as belief items for the final version of the Beliefs Scale.

Table 4

*Factor Loadings for Belief Items*

<table>
<thead>
<tr>
<th>Belief Item</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine means that I am allowing</td>
<td>.745</td>
<td>.091</td>
</tr>
<tr>
<td>God to work through doctors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowing God to work through doctors is to prevent illness is: not</td>
<td>.556</td>
<td>.034</td>
</tr>
<tr>
<td>important/important</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine is not necessary because</td>
<td>.748</td>
<td>.085</td>
</tr>
<tr>
<td>health and illness determined by God will</td>
<td></td>
<td></td>
</tr>
<tr>
<td>God will has an effect on the extent to which a person is healthy or ill:</td>
<td>.680</td>
<td>.141</td>
</tr>
<tr>
<td>agree/disagree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting my daughter vaccinated means that I trust the drug company that</td>
<td>.049</td>
<td>.606</td>
</tr>
<tr>
<td>makes vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trusting drug company that makes the HPV vaccine is: not important/</td>
<td>.125</td>
<td>.628</td>
</tr>
<tr>
<td>important</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating my daughter with HPV vaccine means I trust the government</td>
<td>.196</td>
<td>.585</td>
</tr>
<tr>
<td>has told people everything about the vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trusting that the government has told people everything about the HPV</td>
<td>.126</td>
<td>.662</td>
</tr>
<tr>
<td>vaccine is: not important/important</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Factor Loadings for Belief Items**

<table>
<thead>
<tr>
<th>Belief Item</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine will help prevent her from getting cervical cancer in the future</td>
<td>.262</td>
<td>.605</td>
</tr>
<tr>
<td>Right now preventing my daughter from getting cervical cancer is: important/not important</td>
<td>.074</td>
<td>.419</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with the HPV vaccine might lead her to become more sexually active</td>
<td>.215</td>
<td>.464</td>
</tr>
<tr>
<td>Sexual activity among preteens and teenagers is: unacceptable/acceptable</td>
<td>.377</td>
<td>.190</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine means I allow my daughter to be lab rat: disagree/agree</td>
<td>.075</td>
<td>.500</td>
</tr>
<tr>
<td>Being a lab rat for drug companies is: undesirable/desirable</td>
<td>.659</td>
<td>.064</td>
</tr>
<tr>
<td>Getting my daughter vaccinated with HPV vaccine may lead to reactions or side effects from the vaccine</td>
<td>.262</td>
<td>.605</td>
</tr>
<tr>
<td>Reactions or side effects from the vaccine are: unacceptable/acceptable</td>
<td>.074</td>
<td>.419</td>
</tr>
</tbody>
</table>

Principal Components factor analysis was repeated for the retained eight belief items. The scree plot indicated that the eight items were multidimensional and represented two distinct dimensions of beliefs. A two-factor solution was rotated using the Varimax rotation procedure. The rotation solution yielded two factors with Eigenvalues greater than one that explained 61% of the variance in beliefs, mistrust, and religion. Each factor was conceptually distinct and consisted of four items. One factor consisted of four religious belief items (God’s work and God’s will) with excellent loadings greater than .71 (Comry & Lee, 1992). The second factor consisted of the four mistrust items with excellent loadings. The final 8-item behavioral beliefs scale consists of two distinct dimensions: religious beliefs and mistrust beliefs.
Finally, the scree plot indicated the Intentions Scale was unidimensional and accounted for 98% of the variance in HPV intentions. For the Attitudes Scale, the scree plot indicated that the 10-item scale was unidimensional and accounted for 77% of the variance in attitudes.

Reliability Analysis

Cronbach’s alpha was used to assess the internal consistency reliability for the Religious Beliefs Scale, the Mistrust Beliefs Scale, the Attitudes Scale, and Intentions Scale. The alpha coefficient for the 4-item Religious Beliefs Scale was 0.78; the 4-item Mistrust Beliefs Scale, 0.77; the 10-item Attitude Scale, 0.96; and the 3-item Intention Scale, 0.99.

For this study, the 3-item Intention scale, 10-item Attitude Scale, 4-item Religious Beliefs Scale, and the 4-item Mistrust Beliefs Scale was used to measure HPV vaccine intentions, attitudes, and beliefs, respectively. For the Intention Scale, mean scores were computed with a possible range of 1 to 7. Higher scores indicated a stronger intention to perform a particular behavior. Similarly, attitude scores were computed as mean scores with a possible range of 1 to 7. Higher scores indicated a more positive attitude toward the target behavior. For the Religious and Mistrust Beliefs Scales, each behavioral belief item score was multiplied its correspondent outcome evaluation item score. A composite belief score for each scale was computed as a sum of the products for each belief and outcome item pair in the scale, with a possible range of 4 to 196. Higher composite scores indicated more favorable beliefs.
Sample Description

Demographic characteristics of the sample are summarized in Table 5. The majority of subjects were female (n = 219) who were married (n = 133) and had some form of health insurance (n = 221). The mean age of the sample was 39 years (SD = 6.8) with a range of 26 to 55 years of age. Thirty three percent of respondents graduated high school (n = 82), and 44% had some college education (n = 116). The majority of parents indicated that no one close to them had ever been diagnosed with cervical cancer (n = 217). The religious affiliation of 39% of subjects was Christian (n = 102), 27% were Catholic (n = 71), and 12% were Protestant (n = 31). The majority of parents attended religious services. Forty one percent attended religious services rarely or never to a few times a year (n = 107), 22% indicated they attended services 1-3 times per month (n = 58), and 37% attended services at least once a week (n = 97). The mean ages of the respondents’ first, second, and third daughters were 13 years (SD = 2.7), 14 years (SD = 2.0), and 15 years (SD = 1.7) respectively. Forty two percent of parents’ household income was less than $35,000 per year (n = 110), 30% ranged from $35,000 to less than $75,000 (n = 79), and 28% ranged from $75,000 to greater than $100,000 (n = 73).

Table 5

Sample Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>219</td>
<td>83.6</td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>16.4</td>
</tr>
<tr>
<td>Highest Level of Education Completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>23</td>
<td>8.8</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>82</td>
<td>31.3</td>
</tr>
<tr>
<td>Some College</td>
<td>116</td>
<td>44.3</td>
</tr>
<tr>
<td>College Graduate</td>
<td>41</td>
<td>15.6</td>
</tr>
</tbody>
</table>
Household Income

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>under $10,000</td>
<td>22</td>
<td>8.4</td>
</tr>
<tr>
<td>$10,000 to less than $20,000</td>
<td>34</td>
<td>13</td>
</tr>
<tr>
<td>$20,000 to less than $35,000</td>
<td>54</td>
<td>20.6</td>
</tr>
<tr>
<td>$35,000 to less than $50,000</td>
<td>41</td>
<td>15.6</td>
</tr>
<tr>
<td>$50,000 to less than $75,000</td>
<td>38</td>
<td>14.5</td>
</tr>
<tr>
<td>$75,000 to less than $100,000</td>
<td>35</td>
<td>13.4</td>
</tr>
<tr>
<td>$100,000 or more</td>
<td>38</td>
<td>14.5</td>
</tr>
</tbody>
</table>

Religion

<table>
<thead>
<tr>
<th>Religion</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catholic</td>
<td>71</td>
<td>27.1</td>
</tr>
<tr>
<td>Protestant</td>
<td>31</td>
<td>11.8</td>
</tr>
<tr>
<td>Jewish</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td>Muslim</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td>Christian</td>
<td>102</td>
<td>38.9</td>
</tr>
<tr>
<td>None</td>
<td>14</td>
<td>5.3</td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Rate of Religious Attendance

<table>
<thead>
<tr>
<th>Attendance Frequency</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely or Never</td>
<td>32</td>
<td>12.2</td>
</tr>
<tr>
<td>A few Times a Year</td>
<td>75</td>
<td>28.6</td>
</tr>
<tr>
<td>1-3 Times a Month</td>
<td>58</td>
<td>22.1</td>
</tr>
<tr>
<td>Once a Week</td>
<td>69</td>
<td>26.3</td>
</tr>
<tr>
<td>More than Once a Week</td>
<td>28</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Married</td>
<td>66</td>
<td>25.2</td>
</tr>
<tr>
<td>Married/Partnered</td>
<td>133</td>
<td>50.8</td>
</tr>
<tr>
<td>Separated</td>
<td>26</td>
<td>9.9</td>
</tr>
<tr>
<td>Divorced</td>
<td>35</td>
<td>13.4</td>
</tr>
<tr>
<td>Widowed</td>
<td>2</td>
<td>.8</td>
</tr>
</tbody>
</table>

Health Insurance

<table>
<thead>
<tr>
<th>Insurance Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>221</td>
<td>84.4</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>16.6</td>
</tr>
</tbody>
</table>

Data Collection Procedures

Prior to data collection, this study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey and the IRB of Farmingdale State College to protect the rights of human subjects participating in the study.

Data were collected from a convenience sample of program participants from EOC and students from FSC. The Assistant Dean of Programs for EOC provided the PI
access to program participants at the Brentwood and Hempstead, New York campuses. In addition, the Dean of the School of Health Sciences at FSC allowed the PI access to all students within this department.

A description of the study procedures as well as inclusion criteria were verbally described by the PI at the beginning of class and those subjects meeting the criteria were asked to participate. EOC program participants and FSC students who did not meet the inclusion criteria and subjects unwilling to participate in the study were dismissed from the class until all questionnaires were completed. At the beginning of class, each eligible potential participant was given the informational letter. The demographic data form and the HPV Beliefs, Attitudes, and Intentions Questionnaire were distributed after the PI has explained the study procedure and the participants read the informational letter. Subjects were given as much time as needed to complete the questionnaires, which took approximately 20 minutes. The PI remained in the room to answer any questions and collect the questionnaires upon completion.

Data Analysis Plan

A statistical database was created by the PI using the Statistical Package for the Social Sciences (SPSS) version 17.0 for Windows (SPSS, 2008). Demographic, beliefs, attitudes, and HPV vaccine intention data were entered into the SPSS database by the PI. A descriptive analysis of the demographic data was conducted to describe the sample characteristics. Frequency tables, histograms, and scatterplots were used to assess distribution of study variables for normality. Tests for skewness and kurtosis were also conducted. Data was inspected for inconsistencies, outliers, and wild data entry codes. Included in the data analysis was the description of the sample including means and
standard deviations. A code book which includes copies of the original data set and the cleaned data set, copies of the basic descriptives, correlations, and regression analyses, syntax and output, and notes to self was created to document the analysis file.

Correlational analysis of the study variables was conducted using both Pearson Product Moment Correlation and chi square for nominal level data. In line with a conservative approach, a two-tailed test of significance set at .05 level was used, even if the hypothesized relationship is directional (Polit & Beck, 2004). The correlation matrix was examined to determine if there were any demographic variables that were significantly correlated with the dependent variable and that need to be controlled in subsequent analyses. In addition, the correlation matrix was examined to determine if beliefs and attitude scores were significantly related to HPV vaccine intention scores, and if belief scores were significantly related to attitude scores.

To test hypothesis three, Baron and Kenny's test for mediation was used (Baron & Kenny, 1986). According to Baron and Kenny a mediator is a variable that specifies how the association occurs between an independent variable (IV) and an outcome variable. Baron and Kenny (1986) state that the following conditions must be present to establish mediation, 1) the independent variable (beliefs) must be significantly related to the mediator (attitudes), 2) the independent variable (beliefs) must be significantly related to the dependent variable (HPV vaccine intention), and 3) the mediator (attitudes) must be significantly related to the dependent variable (HPV vaccine intention). Since significant relationships among study variables existed, three regressions were conducted to test the mediation model. The first regression equation tested the relationship between behavioral beliefs and HPV vaccine intention. The second regression tested the
relationship between behavioral beliefs and attitudes. In the third regression, behavioral beliefs and attitude scores were entered into the regression simultaneously. In this regression, complete or partial mediation was determined. Complete mediation occurs if, after controlling for the effects of mediating variable on the dependent variable, the effect of the independent variable on the dependent variable becomes zero, or in partial mediation the effect of the independent variable on the dependent variable diminishes and the intervening variable becomes more significant (Baron & Kenny, 1986).

Human Subjects Protection

This study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey and the IRB of Farmingdale State College to protect the rights of human subjects participating in the study. EOC is a program within the SUNY system, therefore the IRB of Farmingdale State College is responsible for protection of those participants. There was no more than minimal risk to subjects participating in the study where the magnitude of harm or discomfort anticipated are no greater, in and of themselves, than those ordinarily encountered in daily life. An exempt IRB review was obtained since participation in the study only required the completion of questionnaires. Participants’ responses to questionnaire items were anonymous in that there were no documents or identifiers linking participants’ identities to their responses.

The PI maintained completed questionnaires in a locked cabinet and was the only person with access to the cabinet. Computer files were password protected and only the PI had access to the password. Computer files were backed up onto a CD and the CD was maintained in the locked cabinet.
Data collected from this study that is published or presented will be reported only as grouped data, and no participants will be identified by name. CDs and written documents will be destroyed three years after completion of the research study.
Chapter 4

Analysis of the Data

The purpose of this study was to examine the relationships among beliefs, attitudes, and HPV vaccine intentions in a sample of Black parents. Data were collected from parents who self-identified as Black and had daughters between the ages of 9 and 17 years. The following instruments were used in this study: 1) a demographic questionnaire developed by the PI was used to collect information on participants’ gender, age, highest educational level, household income, religion, frequency of attendance at religious services, marital status, ages of daughters, health insurance status, and knowledge of close friends or family members having cervical cancer; and 2) the HPV Beliefs, Attitudes, and Intention Questionnaire, developed by the PI to collect information on religious beliefs, mistrust beliefs, attitudes, and HPV vaccine intention.

Statistical Description of the Variables

A statistical database was created by the PI using SPSS version 17.0 for Windows (SPSS, 2008). Data from the HPV Beliefs, Attitudes, and Intention Questionnaire was entered into the database. A code book including copies of the original data set, copies of the basic descriptives, correlations, regression analyses, syntax and output, and notes to self was created and maintained in password protected computer files. Data were cleaned by inspecting for inconsistencies, outliers, and wild data entry codes. Frequency tables, histograms, and scatterplots were used to assess distribution of study variables for normality. Tests for skewness and kurtosis were also conducted (see Table 5). The degree of skewness was computed by converting the skewness statistic for each study variable to z-scores. A z-score between +1.96 and -1.96 represented a normal distribution of scores.
Scores for HPV vaccine attitude and intention indicated a mild negative skew and were not transformed (Tabachnick & Fidell, 2007). Scores for mistrust beliefs, religious beliefs, and composite beliefs were normally distributed (see Table 6).

Table 6

**Summary of Distribution of Study Variables**

<table>
<thead>
<tr>
<th></th>
<th>Skewness</th>
<th>SE</th>
<th>Skewness z-score</th>
<th>Kurtosis</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV Intention</td>
<td>-.478</td>
<td>.151</td>
<td>3.16</td>
<td>-1.170</td>
<td>.300</td>
</tr>
<tr>
<td>HPV Attitude</td>
<td>-.419</td>
<td>.153</td>
<td>2.73</td>
<td>-.751</td>
<td>.304</td>
</tr>
<tr>
<td>Mistrust Beliefs</td>
<td>.278</td>
<td>.151</td>
<td>1.84</td>
<td>-.868</td>
<td>.301</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>.254</td>
<td>.151</td>
<td>1.68</td>
<td>-.647</td>
<td>.301</td>
</tr>
<tr>
<td>Composite HPV Beliefs</td>
<td>.216</td>
<td>.152</td>
<td>1.42</td>
<td>-.444</td>
<td>.302</td>
</tr>
</tbody>
</table>

**Dependent Variable**

A mean HPV intention score was computed based on the 3-item Intention Scale.

According to Ajzen (2006), higher scores indicate a stronger intention to perform a particular behavior. Responses of the sample of Black parents (n = 262) ranged from 1 to 7 (M = 4.52, SD = 2.13), indicating that, on average, the participants were likely to intend to have their daughters vaccinated. Response frequencies revealed that 49% of the sample indicated that they were extremely likely to intend to vaccinate their daughters with the HPV vaccine, 20.7% were likely to intend to vaccinate, and 28.3% were extremely unlikely to intend to vaccinate their daughters.
**Independent Variables**

**Attitude**

A mean attitude score was calculated based on the 10-item Attitude Scale. According to Ajzen (2006), higher scores indicate a more positive attitude toward a particular behavior. Attitude scores ranged from 1 to 7 with a mean score of 4.5 (SD = 1.57), indicating that, on average, the participants were likely to have a positive attitude about the HPV vaccine. In this sample, 71.3% of Black parents reported a positive attitude about vaccinating their daughters with the HPV vaccine.

**Composite Beliefs**

A composite belief score was computed by summing the scores from the Mistrust Belief Scale and the Religious Belief Scale. According to Ajzen (2006), higher scores indicate more favorable beliefs about a particular behavior. Composite scores ranged from 4 to 196 with a mean composite belief score of 91 (SD = 41) (see Table 7), indicating that, on average, participants had slightly less favorable beliefs about having their daughters receive the HPV vaccine.

**Table 7**

**Summary of Scores for Study Variables**

<table>
<thead>
<tr>
<th></th>
<th>Mean Score</th>
<th>SD</th>
<th>Range of Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>4.52</td>
<td>2.13</td>
<td>1-7</td>
</tr>
<tr>
<td>Attitude</td>
<td>4.5</td>
<td>1.57</td>
<td>1-7</td>
</tr>
<tr>
<td>Composite Beliefs</td>
<td>91</td>
<td>41</td>
<td>4-196</td>
</tr>
<tr>
<td>Mistrust Beliefs</td>
<td>47.66</td>
<td>26.64</td>
<td>2-98</td>
</tr>
<tr>
<td>Religious Beliefs</td>
<td>43.34</td>
<td>26.12</td>
<td>2-98</td>
</tr>
</tbody>
</table>
Mistrust Beliefs

Belief item scores for the Mistrust Beliefs Scale were multiplied by their correspondent outcome evaluation item score. A composite mistrust belief score was computed as the sum of the products of each mistrust item pair in the scale, with a possible range of 2 to 98. Higher scores indicate more favorable trust beliefs, and lower scores reflected mistrust beliefs. The sample mean score for the Mistrust Belief Scale was 47.66 (SD = 26.64), indicating that, on average, at least one half of all participants reported a level of trust of the government and drug companies that ranged from slight to not at all. Fifty two percent of the sample indicated drug company and government mistrust beliefs, while 48% reported beliefs that reflected trust in drug companies and the government.

Religious Beliefs

Religious item scores for the Religious Beliefs Scale were multiplied by their correspondent outcome evaluation score. A composite religious belief score was computed as the sum of the products of each religious item pair in the scale, with a possible range of 2 to 98. Higher scores reflected more favorable beliefs in the role of God’s will in health and health care, and lower scores reflected less favorable beliefs in God’s will in health and health care. The mean score for the Religious Beliefs Scale was 43.34 (SD = 26.12), indicating that, on average, the participants had slightly less favorable religious beliefs. Response frequencies revealed that 52.7% of parents sampled reported less favorable religious beliefs, while 47.3% respondents reported more favorable religious beliefs.
Psychometric Properties of the HPV Beliefs, Attitudes, and Intention Scales

Internal consistency reliability for the Intention Scale, Attitude Scale, Mistrust Belief Scale, and Religious Beliefs Scale, and Composite Beliefs Scale was computed. The coefficient alphas for the Intention Scale and Attitude Scale had excellent reliabilities (Nunnally & Bernstein, 1994) and are reported in Table 6. Coefficient alphas for the Religious Beliefs Scale, Mistrust Beliefs Scale, and Composite Beliefs Scale were within an acceptable range of .60 -.70 for a new instrument (Aron, Aron, & Coups, 2009; Knapp & Brown, 1995; Nunnally & Bernstein, 1994) (see Table 8).

Table 8

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention Scale</td>
<td>.95</td>
</tr>
<tr>
<td>Attitude Scale</td>
<td>.95</td>
</tr>
<tr>
<td>Mistrust Belief Scale</td>
<td>.65</td>
</tr>
<tr>
<td>Religious Belief Scale</td>
<td>.71</td>
</tr>
<tr>
<td>Composite Beliefs Scale</td>
<td>.68</td>
</tr>
</tbody>
</table>

Hypothesis Testing

Hypotheses 1 and 2 were tested using Pearson Product Moment Correlation. Two tailed tests of significance set at the .05 level were used to test the hypothesized relationships. Hypothesis 3 was tested using multiple regression analysis according to Baron and Kenny’s (1986) method for testing a mediation model.

Prior to hypothesis testing, correlational analysis was conducted to determine if there were any demographic variables that were significantly correlated to HPV vaccine
intention, the dependent variable (see table 9). A significant relationship was found between HPV intention and marital status of the parent, age of the first daughter, and health insurance status. These variables were controlled for in subsequent analyses.

Table 9

**Correlation Matrix of Demographic and Main Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parental HPV Vaccine Intention</td>
<td>.87**</td>
<td>.26**</td>
<td>.08</td>
<td>.22**</td>
<td>.17**</td>
<td>.16*</td>
<td>-.26**</td>
<td></td>
</tr>
<tr>
<td>2. Parental HPV Vaccine Attitude</td>
<td>.87**</td>
<td>.32**</td>
<td>.04</td>
<td>.24**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mistrust Beliefs</td>
<td>.26**</td>
<td>.32**</td>
<td>.20**</td>
<td>.78**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Religious Beliefs</td>
<td>.08</td>
<td>.04</td>
<td>.20**</td>
<td>.77**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Composite Beliefs</td>
<td>.22**</td>
<td>.24**</td>
<td>.78**</td>
<td>.77**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Marital Status</td>
<td>.17**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Age of First Daughter</td>
<td>.16*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Health Insurance Status</td>
<td>-.26**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation significant at 0.01 level (2-tailed)
* Correlation significant at 0.05 level (2-tailed)

**Hypothesis 1**

Hypothesis 1 proposed that parental attitudes were significantly related to vaccine intention. Correlational analysis indicated a significant relationship between parental attitudes and vaccine intention ($r = .865, p < .001$). Hypothesis 1 was supported.

**Hypothesis 2**

Hypothesis 2 proposed that behavioral beliefs were significantly related to parental vaccine attitudes. Correlational analysis was used to test the hypothesized relationship. Findings indicated a significant relationship between behavioral beliefs and parental vaccine attitudes ($r = .239, p < .001$). Hypothesis 2 was supported.
Hypothesis 3

Hypothesis 3 proposed that, when the effects of the mediator, parental vaccine attitudes was controlled for, the magnitude and significance of the relationship between the independent variable, HPV behavioral beliefs and the dependent variable, parental HPV vaccine intention, would diminish. In order to test this hypothesis, a series of three regressions was conducted according to Baron and Kenny’s (1986) method for testing a mediation model.

The first regression tested the independent relationship between the HPV vaccine behavioral beliefs, that is, the composite religion and mistrust beliefs scores, and parental HPV vaccine intention, controlling for the effect of the demographic covariates (marital status, age of first daughter, and health insurance status). Findings revealed that the independent variable, HPV vaccine behavioral beliefs, was a significant predictor of the dependent variable, HPV vaccine intention ($\beta = .180, p = .003$). In addition, 13% of the variance in intention was accounted for by the covariates and HPV vaccine beliefs ($R^2 = .134$). Specifically, 10% of the variance in intentions was accounted for by the covariates, and HPV beliefs accounted for only 3% of the variance in intentions.

The second regression tested whether the independent variable, HPV vaccine behavioral beliefs predicted the mediating variable, HPV parental attitudes. Findings indicated that the independent variable, HPV behavioral beliefs, was a significant predictor of the mediator, parental HPV vaccine attitudes ($\beta = .239, p < .001$). The $R^2$-squared statistic was .057, indicating HPV behavioral beliefs accounted for 6% of the variance in HPV vaccine attitudes.
In the third regression, the covariates, marital status, age of first daughter, and health insurance status, were entered in the first step, followed by a simultaneous entry of the independent variable, HPV behavioral beliefs, and the mediating variable, HPV vaccine attitudes, in the second step. Collinearity statistics, including the variance inflation factor and tolerance indicated no multicollinearity between predictors. Findings revealed, that, controlling for the effects of the mediator, parental HPV vaccine attitudes, and covariates on the dependent variable, parental HPV vaccine intention, the effect of the independent variable on the dependent variable became non-significant ($\beta = -.013$, $p = .692$). This analysis indicated that parental vaccine attitudes completely mediated the relationship between HPV vaccine behavioral beliefs and parental HPV vaccine intention. The covariates, independent variable (HPV beliefs), and mediator (HPV attitudes), contributed 76% of the variance in HPV vaccine intention. Specifically, the covariates accounted for 11% of the variance in HPV intention, and the independent variable and mediator contributed an additional 65% variance in HPV vaccine intention. Hypothesis 3 was supported.

In summary, parental HPV vaccine attitudes were significantly related to parental HPV vaccine intention. In addition, HPV behavioral beliefs were significantly related to parental HPV vaccine attitudes. In addition, parental HPV vaccine attitudes fully mediated the relationship between HPV behavioral beliefs and parental HPV vaccine intention. These results are presented in Table 10.
Table 10

**Summary of Regression Results**

**Model 1**

Regression Analysis for Variables Predicting Parental HPV Vaccine Intention

<table>
<thead>
<tr>
<th>Variable</th>
<th>b</th>
<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>0.10</td>
<td>.095</td>
<td>.102</td>
</tr>
<tr>
<td>Age of first daughter</td>
<td>0.11</td>
<td>.062</td>
<td></td>
</tr>
<tr>
<td>Health insurance status</td>
<td>-0.24</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Step 2

HPV Vaccine Behavioral Beliefs 0.18 .003 .031

**Model 2**

Regression Analysis for Predicting Mediating Variable - Parental HPV Vaccine Attitude

<table>
<thead>
<tr>
<th>Variable</th>
<th>b</th>
<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV Vaccine Behavioral Beliefs</td>
<td>0.23</td>
<td>.000</td>
<td>0.06</td>
</tr>
</tbody>
</table>

**Model 3**

Regression Analysis for Variables Predicting Parental HPV Vaccine Intention

<table>
<thead>
<tr>
<th>Variables</th>
<th>b</th>
<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>0.09</td>
<td>.125</td>
<td></td>
</tr>
<tr>
<td>Age of first daughter</td>
<td>0.12</td>
<td>.045</td>
<td></td>
</tr>
<tr>
<td>Health insurance status</td>
<td>-0.24</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>
Correlational analysis indicated that mistrust beliefs were significantly related to parental HPV vaccine attitudes and intention, therefore further analyses were conducted to determine if HPV parental vaccine attitudes mediated the relationship between mistrust beliefs and parental vaccine intention. A series of three regressions was conducted according to Baron and Kenny's (1986) method for testing a mediation model.

In the first model, a regression analysis was conducted to investigate the association between the independent variable, mistrust beliefs, and the dependent variable, parental HPV vaccine intention, controlling for the effect of covariates (marital status, age of first daughter, and health insurance status) on the dependent variable. Findings revealed that mistrust beliefs were a significant predictor of vaccine intention ($\beta = .240, p < .001$). In addition, the covariates and mistrust beliefs accounted for 16% of the variance in HPV vaccine intent ($R^2 = .159$). Specifically, 10% of the variance in intentions was accounted for by the covariates, and mistrust beliefs accounted for 6% of the variance in HPV intention.

In the second model, a regression analysis was conducted to investigate the association between the independent variable, mistrust beliefs and the mediator, parental HPV vaccine attitudes. Results demonstrated that mistrust beliefs were a significant predictor of parental HPV vaccine attitudes ($\beta = .320, p < .001$). The R-squared statistic of .102 indicated that mistrust beliefs accounted for 10% of the variance in parental HPV vaccine attitudes.
In the third model, the covariates, marital status, age of first daughter, and health insurance status, were entered in the first step, followed by a simultaneous entry of the independent variable, mistrust beliefs, and the mediating variable, parental HPV vaccine attitudes. Collinearity statistics, including the variance inflation factor and tolerance indicated no multicolinearity between predictors. Findings from this analysis indicated that, controlling for the effects of the mediator, parental HPV vaccine attitudes, and covariates on the dependent variable, parental HPV vaccine intention, the effect of the independent variable, mistrust beliefs, became non-significant (β = -.025, p = .454). These findings demonstrated that parental HPV vaccine attitudes completely mediated the relationship between mistrust beliefs and parental HPV vaccine intention. The covariates, independent variable (mistrust beliefs), and mediator (HPV attitudes) contributed 76% of the variance in HPV vaccine intention. Specifically, the covariates accounted for 11% of the variance in HPV intention, and the independent variable and mediator contributed an additional 65% variance in HPV vaccine intention. These results are summarized in Table 11.

Table 11

Summary of Regression Results

Model 1

Regression Analysis for Variables Predicting Parental HPV Vaccine Intention

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
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<td></td>
</tr>
<tr>
<td>Age of first daughter</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Health insurance status</td>
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<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Step 1</th>
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<tbody>
<tr>
<td>Marital status</td>
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<td></td>
</tr>
<tr>
<td>Age of first daughter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance status</td>
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</tbody>
</table>
### Model 2
Regression Analysis for Variables Predicting Mediating Variable Parental HPV Vaccine Attitude

<table>
<thead>
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<th>Variable</th>
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<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mistrust Beliefs</td>
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<td>.000</td>
<td>.10</td>
</tr>
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</table>

### Model 3
Regression Analysis for Variables Predicting Parental HPV Vaccine Intention

<table>
<thead>
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<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
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<td></td>
</tr>
<tr>
<td>Marital status</td>
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<td>.108</td>
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<tr>
<td>Age of first daughter</td>
<td>.120</td>
<td>.050</td>
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<tr>
<td>Health insurance status</td>
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<td>.000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>β</th>
<th>p-value</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Parental HPV Vaccine Attitude</td>
<td>.85</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Mistrust Beliefs</td>
<td>-.03</td>
<td>.454</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 5

The purpose of this study was to examine determinants of Black parents’ intention to have their daughters receive the HPV vaccine. Specific determinants examined in this study consist of constructs from the Theory of Planned Behavior (Ajzen, 1991) and include behavioral intentions, attitudes, and beliefs. This chapter includes interpretation of the findings of the hypothesized relationships among behavioral beliefs, parental attitudes, and HPV vaccine intentions among Black parents in relation to the theory and empirical findings from which these hypotheses were derived.

**HPV Vaccine Intention**

Proponents of the TPB theorize that the most important direct determinant of behavior is behavioral intention, therefore the stronger an individual’s intention to perform a behavior, the more likely he or she is to be successful in performing that behavior. Empirical evidence indicates that, on average, Blacks reported lower intentions than Whites to get the HPV vaccine for their daughters (Cates et al., 2009; Constantine & Jerman, 2007; Fazekas et al., 2008). In this within group study, mean HPV intention scores ($M = 4.52$, $SD = 2.13$, range = 1 to 7) suggested that a majority of Black parents are, on average, likely to intend to have their daughters vaccinated, a finding similar to HPV vaccine intentions of other racial groups in previous research. For example, Askelson and colleagues (2010) found similar mean HPV vaccine intention scores in a sample of predominantly white mothers with 9 to 15 year old daughters ($M = 4.71$, $SD = 2.21$). In this study, 20% of Black parents indicated that they were likely to intend to have their daughters receive the HPV vaccine, and nearly half of the respondents (49%) were very likely to intend to vaccinate their daughters against HPV.
Though a majority of respondents indicated that they intended to get their daughters vaccinated, findings from this study also indicate that nearly one-third (30.3%) of Black parents were somewhat or very unlikely to intend to have their daughters vaccinated with the HPV vaccine. Clearly, this study reveals within group HPV vaccine intention variations among Black parents.

Additionally, total intention scores among Black parents varied by marital status. Nearly 51% of parents in this study were married, and marital status was found to be positively related to HPV vaccine intention scores. Similarly, Lumen and colleagues (2010) found that married parents were more likely to intend to vaccinate their children than parents who were not married, divorced, widowed, or separated. It is plausible, based on results of these studies, that parents who are married feel more supported in their decision to intend to vaccinate their daughters than unmarried parents. While income was not a significant variable in this study, marriage may also serve as a proxy for household/parental resources, allowing parents to be more able to attend to the needs of their children. The role of support as it relates to intention merits further exploration.

HPV vaccine intention also varied by insurance status within the study sample. Eighty-four percent of participants had health insurance, and, not surprisingly, health insurance status was positively associated with high HPV vaccine intention scores; that is, parents with health insurance also tended to report an intention to have their daughters vaccinated with HPV vaccine. This finding is consistent with results of a study by Kahn and colleagues (2008), indicating that parents who had health insurance were more likely to intend to have their daughters receive the HPV vaccine than parents who did not have
health insurance. These findings underscore the important relationship between parents’ financial access to care and HPV vaccination of Black adolescent females.

Lastly, HPV vaccine intention was positively related to parents’ having either an "only" daughter between the ages of 9 and 17, or youngest daughter between the ages of 9 and 17. The majority of parents in this study had one daughter, and less than 25% of parents had more than one daughter between the ages of 9 and 17. These findings suggest that parents who considered the possibility of their child’s current or future sexual activity were more likely to intend to have their daughters vaccinated against HPV.

Results of a study by Mays, Sturm, and Zimit (2004) indicated similar findings related to parents’ willingness to vaccinate their youngest children against sexually transmitted diseases based on the possibility of future sexual activity.

**HPV Vaccine Attitudes**

Theoretical and empirical literature indicate that the more favorable the attitude towards a behavior, the stronger the intention to perform the behavior becomes (Ajzen, 1991). Research studies suggest that, in general, both Black parents and White parents have similar attitudes and concerns about vaccines that their children receive (Shui et al., 2006; Sturm, Mays & Zimit, 2005) however, Black parents are significantly more likely to report a higher level of concern and more negative attitudes about vaccines compared to White parents (Prislin et al., 1998; Shui et al., 2006). Surprisingly, in this study, on average, Black parents reported a positive attitude about vaccinating their daughters against HPV ($M = 4.5$, $SD = 1.57$, range = 1 to 7). In addition, results from this study indicate that among the parents who reported a positive attitude about vaccinating their daughter with HPV vaccine, 42% reported a very positive attitude and 38.6% had a
somewhat positive attitude. On the other hand, 19.4% had a negative attitude about HPV vaccination. In contrast to studies which found more negative vaccine attitudes among Black parents compared White parents, the findings from this study suggest that HPV vaccine attitudes among Black parents vary and are generally positive within this group.

Ancillary findings indicate that education, marital status, and health insurance are likely important covariates of Black parents HPV vaccine attitudes. Results of several studies that examined parental vaccine attitudes found a significant relationship between level of education and vaccine attitudes (Gellin, Maibach, & Marcuse, 2008; Rosenthal et al., 2008; Waller, Marlow, & Wardle, 2006). In a study of parental vaccine attitudes, higher parental education level was significantly associated with positive vaccine attitudes (Shui, Weintraub, & Gust, 2006). Prislin and colleagues (1998) found that better educated parents had lower levels of concern and more positive attitudes about immunizations. Clearly, more research is needed that examines the relationship between sociodemographic characteristics and HPV vaccine attitudes among Black parents.

**HPV Vaccine Mistrust Beliefs**

Research indicates that mistrust beliefs related to the government and medical community are prevalent among Blacks (Downs et al., 2010; Scarinci et al., 2007). In addition, research has shown that Blacks are far more likely to mistrust their healthcare provider and government compared to Whites (Armstrong et al., 2008; Boulware et al., 2002). Consistent with the literature, findings from this study revealed that a little over one-half of Black parents (52%) reported government and drug company mistrust beliefs related to HPV vaccine safety. Specifically, 36.6% were found to have strong mistrust beliefs, and 16.1% had somewhat strong mistrust beliefs. Although historical mistrust of
the health care system has been attributed to older Blacks (Peters, Aroian, & Flack, 2009), these findings indicate that mistrust beliefs have considerable influence on the beliefs of younger Black parents. There was however, considerable within group variability in mistrust beliefs as the remaining 47.3% of parents in this study indicated some level of trust in the government and pharmaceutical companies. Approximately one-quarter of those parents reported strong trust beliefs and 22% had somewhat strong beliefs.

Interestingly, male gender \((r = -.11, p = .08)\) and age of respondents \((r = -.11, p = .08)\) were negatively related to mistrust scores and trended toward significance. These findings indicate that male parents in this study tended to be mistrustful of the government and drug companies. Similar government mistrust beliefs among men were found in a study by Bogart and Thorburn (2005) that revealed significantly higher mean mistrust beliefs scores of Black adult males \((M = 2.48 \pm 0.90)\) compared to Black female adults \((M = 2.27 \pm 0.78)\). The suggestion of a gender difference in HPV vaccine mistrust beliefs in this study merits further examination in future research.

The age of Black parents in this study ranged from 26 to 55 years \((M = 39, SD = 6.7)\), and findings indicated that older parents were more mistrustful of the government and drug companies than younger parents. Similarly, Peters, Aroian, and Flack (2009) found that older Black adults were more mistrustful of the healthcare system than younger Black adults in a study sample that ranged from 25 to 60 years of age. Conversely, Thorburn and Bogart (2003) found that in a sample of Black adults ranging in age from 18 to 45 \((M = 32.7, SD = 8.1)\), younger respondents were more mistrustful of the government than older respondents. Clearly, the findings in this study and equivocal
findings in the literature regarding a relationship between age of parent and HPV vaccine mistrust beliefs merit further attention since particular age groups among Black parents can be targeted for interventions designed to modify HPV vaccine mistrust beliefs.

Spirituality and religion are important aspects of culture, and some beliefs and perceptions regarding health practices have been shown to be significantly related to religion in the Black population (Blocker et al., 2006). Results from previous empirical work indicate that many Blacks believe that God is in control of their health, that illness may be due to a failure to live according to God’s will, and that healing can come only through prayer and faith in God (Swanson, Crowther, Green, & Armstrong, 2004). In this study, Black parents, on average, reported less favorable beliefs in the role of God’s will in health and health care (M = 43.3, SD = 1.6, range = 2 to 98). Surprisingly, these religious beliefs were not found to be significantly related to parental HPV vaccine attitude or HPV vaccine intention. Specifically, religious beliefs were operationalized as one’s beliefs about allowing God to work through doctors to prevent illness, and the effect of God’s will on the extent to which a person is healthy or ill. Since religious beliefs can be both motivating and demotivating factors for health promotion practices (Blocker et al., 2006), it is plausible that beliefs in God’s will over health examined in this study did not reflect particular religious beliefs that were important motivators for HPV vaccine intention. More work is clearly needed in this area.

Parental Attitudes and HPV Vaccine Intention

According to Ajzen (1991), attitudes drive a person’s intention to perform a behavior, which in turn, influence whether they engage in the behavior. Empirical evidence indicates that parents with a positive attitude about vaccines are more likely to
intend to have their children vaccinated (Liddon et al., 2005; Marlow, Waller, & Wardle, 2007; Ogilvie et al., 2007). Based on the theoretical and empirical literature, a significant relationship between parental attitudes and HPV vaccine intentions was hypothesized.

Hypothesis 1 stated that there is a significant relationship between parental vaccine attitudes and HPV vaccine intention among Black parents. The hypothesis was supported in this study. HPV parental attitudes were found to be a significant and independent predictor of vaccine intention ($\beta = 0.85, p < .001$), among Black parents. In addition, HPV vaccine attitudes accounted for 62% of the variance in HPV vaccine intention. These results suggest that Black parents’ HPV vaccine attitude is a strong driver of HPV vaccine intention, a finding that is similar to findings in previous research (Constantine & Jerman, 2007; Fazekas, Brewer, & Smith, 2008; Gerend, Lee, & Shepherd, 2007). Findings in this study revealed that covariates including marital status, insurance status, and age of first daughter, and behavioral beliefs became insignificant when HPV vaccine attitudes were included in the regression model. This result underscores the importance of HPV vaccine attitudes as a strong predictor of vaccine intention among Black parents, and supports the empirical adequacy of the theory proposition from which the hypothesis was derived.

**Behavioral Beliefs and Attitudes**

According to the Theory of Planned Behavior (Ajzen, 1991), behavioral beliefs predict attitudes about a behavior. A person who has a strong belief that a positively valued outcome will result from performing a behavior, will have a positive attitude toward the behavior. Empirical studies that have explored the distinct beliefs prevalent among Blacks including mistrust and religious beliefs found a significant relationship
between behavioral beliefs and attitudes related to health promoting behaviors. Theses behavioral beliefs included government mistrust beliefs and the role of God’s will in health (Bogart & Bird, 2003; Drayton-Brooks & White, 2004). Based on the theoretical and empirical literature, it was hypothesized that there is a significant relationship between overall religious and mistrust behavioral belief scores and parental vaccine attitude. The hypothesis was supported in this study. A significant relationship between religious and mistrust behavioral beliefs and attitudes was found among Black parents ($\beta = .23$, $p < .001$), indicating that Black parents with more positive behavioral beliefs were more likely to have positive HPV vaccine attitudes. In addition, behavioral beliefs accounted for 6% of the variance in HPV vaccine attitudes. This finding is consistent with results from previous studies that found a significant relationship between behavioral beliefs and attitudes related to health promoting behaviors, and supports the empirical adequacy of the theory proposition from which it was derived. For example, Prislin et al., (1998) found that beliefs about ensuring immunity through immunization contribute strongly to favorable attitudes toward immunization. In another study, Bogart and Thorburn (2003) found that more positive beliefs about the effectiveness of condom use in preventing HIV were associated with positive health promoting attitudes among Black men.

The overall behavioral beliefs score that included both mistrust beliefs and religious beliefs were significantly related to HPV vaccine attitude ($r = .32$, $p < .001$). Surprisingly, the singular dimension of religious beliefs was not related to vaccine attitude or HPV vaccine intention. When examined separately, the second dimension of behavioral beliefs, government and drug company mistrust beliefs, were significantly
related to HPV vaccine attitude ($r = .32, p < .001$). This finding suggests that mistrust beliefs are more important for HPV vaccine attitudes among Black parents, that is, more positive beliefs related to the government and drug companies are associated with more positive health promoting attitudes among Black parents. In addition, these findings suggest that a consideration in intervention research might be to target Black parents’ mistrust beliefs for modification as a strategy to increase HPV vaccination among Black adolescents.

**Beliefs, Attitudes, and HPV Vaccine Intention**

According to Ajzen (1991), it is possible to predict an individual’s attitude toward a behavior from the weighted sum of his beliefs about performing a particular behavior. Since attitude toward a behavior is a determinant of intention, theoretically it is possible to predict intention indirectly through the effect of behavioral beliefs on attitudes that, in turn, has a direct effect on intention. Therefore, based on theoretical and empirical literature, it was hypothesized that attitudes mediate the relationship between behavioral beliefs and HPV vaccine intention among Black parents. This hypothesis was supported in this study. Parental vaccine attitudes were found to completely mediate the relationship between HPV vaccine behavioral beliefs and parental HPV vaccine intention. Study findings support the theory proposition that attitudes are the underlying mechanism through which behavioral beliefs exerts its effects on intentions. This finding is also consistent with previous research. Bogart and Thorburn (2005) found that condom related attitudes mediated the relationship between HIV conspiracy beliefs and condom use. Findings from this study suggest that behavioral beliefs are an important precursor for HPV vaccine attitudes, and addressing negative behavioral beliefs in the context of
parental HPV vaccine attitudes may serve as an important strategy to increase parental HPV vaccine intentions.

An ancillary examination of the relationship between mistrust beliefs, parental attitude and HPV vaccine intention among Black parents revealed that parental attitudes completely mediate the relationship between mistrust beliefs and HPV vaccine intention. This finding is similar to a study by Bogart and Thorburn (2005), indicating that condom related attitudes mediate the relationship between HIV conspiracy beliefs and condom use. The authors indicate that HIV conspiracy beliefs may be a manifestation of some Blacks’s mistrust of the U.S. government and health system, and consequently, some Blacks may be suspicious of HIV prevention information disseminated by these institutions. Likewise, the findings from this study suggest that Black parents’s mistrust of the health system and pharmaceutical industry may fuel negative attitudes about the HPV vaccine that, in turn, leads to a lack of intention to have their daughters receive the HPV vaccine. Results from this study also indicate that interventions designed to address HPV vaccine mistrust beliefs among Black parents may help to increase their HPV vaccine intentions.

In summary, hypothesis 1, which proposed that parental HPV vaccine attitudes were significantly related to HPV vaccine intention among Black parents, was supported in this study. Hypothesis 2, which proposed that there is a relationship between behavioral beliefs and HPV parental vaccine attitudes among Black parents, was also supported in this study. Lastly, hypothesis 3, which proposed that attitudes mediate the relationship between behavioral beliefs and HPV vaccine intention among Black parents, was supported in this study.
Findings from this study provide evidence for the utility of Theory of Planned Behavior (TPB) concepts for Black parents as they relate to HPV vaccine intentions. TPB constructs including parental attitudes and behavioral beliefs were found to explain a considerable proportion of the variance in HPV vaccine intention. The theory concepts and propositions have allowed for the exploration of specific beliefs and attitudes of Black parents which may lead to a better understanding of predictors of behavioral intentions. Parental intentions play a crucial role in behaviors that affect their children’s lives. Understanding relevant factors associated with parental intent to have their daughters vaccinated are essential to reducing opposition to the HPV vaccine and increase vaccination rates among Black female adolescents.
Chapter 6

Summary, Conclusions, Limitations, Implications, and Recommendations

Summary

The purpose of this study was to examine determinants of Black parent’s intention to have their daughters receive the HPV vaccine. Theoretical propositions derived from the Theory of Planned Behavior (TPB) (Ajzen, 1991) were tested in this study. The specific theory constructs under investigation include behavioral intentions, attitudes, and beliefs.

Behavioral intention, the dependent variable in this study, was theoretically defined as an indication of a person’s readiness to perform a certain behavior (Ajzen, 1991). Intentions are a function of salient beliefs and information about the likelihood that performing a certain behavior will lead to a specific outcome. Attitude toward a behavior was theoretically defined as a person’s overall evaluation of performing the behavior in question (Ajzen, 2006). The TBP suggests that a person’s behavior is determined by his or her intention to perform a certain behavior and that this intention is, in turn, a function of attitude toward the behavior. In this theory, a relationship is posited between attitudes and behavioral intentions. This theoretical relationship is supported by empirical literature (Liddon et al., 2005; Marlow, Waller, & Wardle, 2007; Ogilvie et al., 2007).

A behavioral belief was theoretically defined as a person’s perception regarding the consequences of a behavior and the evaluation of those consequences (Ajzen, 2006). According to the TPB, behavioral beliefs are related to attitudes about a behavior. This
theoretical relationship is supported by empirical literature (Bogart & Bird, 2003; Shui et al., 2005).

Theorists also propose that attitudes mediate the relationship between behavioral beliefs and intentions (Ajzen & Fishbein, 1980). Empirical studies support the proposition that attitudes may serve as the underlying mechanism for the relationship between beliefs and behavior (Bogart & Thorburn, 2005; Preslin et al., 1998). The TPB stipulates that behavioral intentions are the immediate antecedent to behavior, therefore it is proposed that attitudes mediate the relationship between beliefs and intentions.

Based on the theoretical and empirical literature, the following hypotheses were derived for this study:

1. Parental HPV vaccine attitudes are significantly related to vaccine intention.
2. Behavioral beliefs are significantly related to parental HPV vaccine attitudes
3. When parental HPV vaccine attitudes are controlled for, the magnitude and significance of the relationship between behavioral beliefs and parental vaccine attitudes will diminish.

The study sample consisted of 262 parents that attended Farmingdale State College (FSC), or were program participants at the Educational Opportunity Center (EOC). All study participants were Black parents who were able to read, write, speak, and understand English, and had daughters between the ages of 9 and 17 years. The majority of subjects were female (84%) who were married and had some form of health insurance. The mean age of the sample was 39 years with a range of 26 to 55 years of age. Thirty three percent of respondents graduated high school, and 44% had some college education. The majority of parents attended religious services (88%). Forty two
percent of parents’ household income was less than $35,000 per year, 30% ranged from $35,000 to less than $75,000, and 28% ranged from $75,000 to greater than $100,000.

Data were collected using the Demographics Questionnaire and the HPV Beliefs, Attitudes, and Intention Questionnaire, both developed by the investigator. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0 for Windows (SPSS, 2008). Characteristics of the sample data were analyzed using descriptive statistics. Pearson Product Moment Correlation analysis was used to examine the interrelationships between study variables and to test Hypothesis 1 and 2. Multiple regression was used to test Hypothesis 3. The level of significance used in the hypothesis testing was .05.

Hypothesis 1, which stated that parental attitudes were significantly related to vaccine intention, was supported. The second hypothesis, which stated that behavioral beliefs were significantly related to parental vaccine attitudes, was also supported. Hypothesis 3, which stated that when the effects of the mediator, parental vaccine attitudes, was controlled for, the magnitude and significance of the relationship between the independent variable, HPV behavioral beliefs and the dependent variable, parental HPV vaccine intention would diminish, was supported.

In summary, theoretical propositions were tested to explain parental HPV vaccine intentions among Black parents. All of the theoretical propositions tested explained the relationship among HPV behavioral beliefs, parental vaccine attitudes, and parental HPV vaccine intention in this sample of Black parents.
Limitations

1. Sampling only Black parents attending Farmingdale State College and the Educational Opportunity Center decreases generalizability of these study findings.

2. The majority of parents who participated in the study had either graduated from high school or attended at least some college. Further testing should include greater numbers of parents with less education.

3. The use of a new instrument to measure HPV vaccine beliefs, attitudes, and intentions did not allow for a systematic comparison to be made across time and among different Black populations.

4. Examination of within group variation of beliefs, attitudes, and HPV vaccine intention among Black parents did not allow for exploration of differences in social class as a possible explanation of HPV vaccine intention.

Conclusions

Conclusions that may be drawn from this study of 262 Black parents include the following theoretical relationships:

1. A significant relationship exists between parental vaccine attitudes and parental HPV vaccine intention.

2. A significant relationship exists between HPV vaccine beliefs and parental vaccine attitudes.

3. Parental vaccine attitudes mediate the relationship between HPV vaccine beliefs and parental HPV vaccine intention.
Implications for Nursing

Research indicates that Black female adolescents are at high risk for HPV infection (CDC, 2006). Infection with HPV is the most common cause of cervical cancer (Newman & Gardner, 2005), therefore providing protection against HPV is essential to this population. Success of the HPV vaccine depends on parents’ decision to have their adolescent daughters vaccinated, therefore determination of within group factors associated with Black parents’ intent to vaccinate allows for the development of effective and culturally sensitive educational programs aimed at increasing vaccination rates.

Theory suggests that the most important determinant of behavior is behavioral intention (Ajzen, 1991). Empirical literature supports the relationship between sociodemographic characteristics and HPV vaccine intention (Kahn et al., 2008; Lumen et al., 2010; Mays, Sturm, & Zimit, 2004). Findings from this study indicate a relationship between HPV vaccine intention and marital status, insurance status, and having either an "only" daughter between the ages of 9 and 17, or youngest daughter between the ages of 9 and 17. To maximize HPV vaccine uptake, interventional programs targeting unmarried parents may provide necessary support for their decision to intend to vaccinate their daughters. Parental education underscoring the possible risk of HPV infection for their daughters, if not currently, then later in life when they are sexually active, may raise awareness of the need for the HPV vaccine.

Research indicates that positive attitudes toward the HPV vaccine are a strong predictor of vaccine intentions (Olgilvie et al., 2007; Waller, Marlow, & Wardle, 2006). Findings from this study indicate that HPV attitudes among Black parents are a significant and independent predictor of vaccine intention, suggesting that Black parents’
HPV vaccine attitude is a strong driver of HPV vaccine intention. This finding is similar to findings in previous research (Constantine & Jerman, 2007; Fazekas, Brewer, & Smith, 2008). It is therefore imperative that educational initiatives targeted toward Black parents focus on strengthening positive attitudes about the HPV vaccine. Emphasis placed on attitudinal concepts such as the vaccine being "safe" and "beneficial" may help reduce opposition to this vaccine and increase vaccine rates.

Theoretical and empirical research findings indicate that behavioral beliefs predict attitudes toward a behavior (Ajzen, 2006; Bogart & Bird, 2003; Shui et al., 2005). Findings from this study indicate a significant relationship between overall religious and mistrust beliefs and vaccine attitude among Black parents. Specific beliefs include mistrust in the government and drug companies, and the role of God's will in health. In addition, when examined separately, government and drug company mistrust beliefs were significantly related to HPV parental vaccine attitude. Tailored educational interventions designed to focus on mistrust beliefs may increase HPV vaccination among Black adolescents. Specifically, addressing mistrust beliefs in the context of prevention messages that emphasize the importance of HPV vaccine in preventing cervical cancer may prove successful in increasing Black parents intention have their daughters receive the vaccine.

Additionally, educational interventions delivered by trusted and credible sources may prove effective in dispelling vaccine mistrust beliefs and fostering positive attitudes toward the vaccine. A number of study findings indicate that tailored educational interventions delivered by respected and credible peers are important for the success of programs designed to increase health promoting activities (Bogart & Thorburn, 2006;
Cheatham, Barksdale, & Rodgers, 2008; Kahn et al., 2008). Peer educators including parents whose daughters have previously received the HPV vaccine may be seen as more credible than members of the public health care system. These peer educators may provide an accepting environment in which mistrust beliefs can be addressed directly by educational messages emphasizing HPV vaccine safety and efficacy, thus dispelling conspiracy myths about the government and the pharmaceutical industry.

Research indicates that attitudes about health promoting behaviors mediate the relationship between behavioral beliefs and intention (Ajzen, 1991, Bogart & Thorburn, 2005). Findings from this study suggest that parental vaccine attitudes completely mediate the relationship between HPV vaccine behavioral beliefs and parental HPV vaccine intention. Tailored educational programs addressing negative behavioral beliefs in the context of parental HPV attitudes may be an important strategy in increasing parental HPV vaccine intentions. For example, educational programs designed to modify government and drug company mistrust beliefs can be addressed by promoting positive attitudes related to the safety, benefit, and usefulness of the HPV vaccine in preventing HPV infection and cervical cancer. Focusing on HPV vaccine behavioral beliefs in the context of parental vaccine attitudes may increase receptivity of educational information, which may, in turn, lead to increased HPV vaccine intentions. If high levels of HPV vaccine intentions translate to increased vaccination rates, the incidence and mortality of cervical cancer could be reduced.

**Recommendations**

Based on findings of this study, the following recommendations for future research are proposed:
1. Replication of this study in multiple geographic settings in order to increase the generalizability of study findings.

2. Examination of the relationship between gender and age differences and HPV vaccine mistrust beliefs among Black parents.

3. Intervention research that tests the effects of educational strategies designed to address overall religious and mistrust beliefs in the context of HPV vaccine attitudes on HPV vaccine intentions among Black parents.

4. Testing of the relationship between HPV behavioral beliefs, attitudes, and intentions among Black parents with sons between the ages of 9 and 17.

5. Testing the relationship between HPV vaccine attitudes and sociodemographic characteristics of parents.

6. A study of parents where race/ethnicity are controlled variables and other variables such as neighborhood, social network, and wealth are investigated.
References


Appendix A

HPV Vaccine Beliefs, Attitudes, and Intentions Questionnaire for Pilot Study

Each question in this section refers to vaccinating adolescent daughters with the HPV vaccine. Circle the number that best represents your view about each statement.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I intend to have my daughter vaccinated with the HPV vaccine</td>
<td>extremely unlikely 1 2 3 4 5 6 7 extremely likely</td>
</tr>
<tr>
<td>2</td>
<td>I will try to have my daughter vaccinated with the HPV vaccine</td>
<td>extremely unlikely 1 2 3 4 5 6 7 extremely likely</td>
</tr>
<tr>
<td>3</td>
<td>I plan on having my daughter vaccinated with the HPV vaccine</td>
<td>extremely unlikely 1 2 3 4 5 6 7 extremely likely</td>
</tr>
<tr>
<td>4</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>harmful 1 2 3 4 5 6 7 beneficial</td>
</tr>
<tr>
<td>5</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>good 1 2 3 4 5 6 7 bad</td>
</tr>
<tr>
<td>6</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>worthless 1 2 3 4 5 6 7 valuable</td>
</tr>
<tr>
<td>7</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>pleasant 1 2 3 4 5 6 7 unpleasant</td>
</tr>
<tr>
<td>8</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>useful 1 2 3 4 5 6 7 useless</td>
</tr>
<tr>
<td></td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td></td>
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<td>------------------------------------------------------</td>
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</tr>
<tr>
<td>9.</td>
<td><strong>unhealthy</strong></td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>advantageous</strong></td>
<td>1</td>
</tr>
<tr>
<td>11.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td></td>
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<tr>
<td></td>
<td><strong>dangerous</strong></td>
<td>1</td>
</tr>
<tr>
<td>12.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>not important</strong></td>
<td>1</td>
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<tr>
<td>13.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td></td>
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<td></td>
<td><strong>responsible</strong></td>
<td>1</td>
</tr>
<tr>
<td>14.</td>
<td>Getting my daughter vaccinated with HPV vaccine will help prevent her from getting cervical cancer in the future.</td>
<td></td>
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<tr>
<td></td>
<td><strong>strongly disagree</strong></td>
<td>1</td>
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<tr>
<td>15.</td>
<td>Right now preventing my daughter from getting cervical cancer is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>not important</strong></td>
<td>1</td>
</tr>
<tr>
<td>16.</td>
<td>Getting my daughter vaccinated with HPV vaccine might lead her to become more sexually active.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>strongly disagree</strong></td>
<td>1</td>
</tr>
<tr>
<td>17.</td>
<td>Sexual activity among preteens and teenagers is:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>unacceptable</strong></td>
<td>1</td>
</tr>
<tr>
<td>18.</td>
<td>Getting my daughter vaccinated with HPV vaccine means that I allow her to be a lab rat for drug companies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>strongly disagree</strong></td>
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<tr>
<td>19.</td>
<td>Being a lab rat for drug companies is:</td>
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<td></td>
<td><strong>extremely undesirable</strong></td>
<td>1</td>
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<tr>
<td>20. Getting my daughter vaccinated with HPV vaccine may lead to reactions or side effects from the vaccine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>21. Reactions or side effects from the vaccine are:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>extremely unacceptable</strong></td>
<td>1 2 3 4 5 6 7 <strong>extremely acceptable</strong></td>
<td></td>
</tr>
<tr>
<td>22. Getting my daughter vaccinated with HPV vaccine means that I am allowing God to work through doctors to prevent illness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>23. Allowing God to work through doctors to prevent illness is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>not important</strong></td>
<td>1 2 3 4 5 6 7 <strong>very important</strong></td>
<td></td>
</tr>
<tr>
<td>24. Getting my daughter vaccinated with HPV vaccine is not necessary because health and illness are determined by God’s will.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>25. God’s will has an effect on the extent to which a person is healthy or ill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>26. Getting my daughter vaccinated with HPV vaccine means that I trust the drug company that makes the vaccine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>27. Trusting the drug company that makes the HPV vaccine is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>not important</strong></td>
<td>1 2 3 4 5 6 7 <strong>very important</strong></td>
<td></td>
</tr>
<tr>
<td>28. Vaccinating my daughter with HPV vaccine means I trust that the government has told people everything about the vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>strongly disagree</strong></td>
<td>1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
<td></td>
</tr>
<tr>
<td>29. Trusting that the government has told people everything about the HPV vaccine is:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>not important</strong></td>
<td>1 2 3 4 5 6 7 <strong>very important</strong></td>
<td></td>
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</table>
Appendix B

HPV Vaccine Beliefs, Attitudes, and Intention Questionnaire

The purpose of the study is to examine beliefs, attitudes, and HPV vaccine intentions among Black parents with pre-adolescent and adolescent daughters. This research may give healthcare providers a better understanding of the reasons parents intend or do not intend to vaccinate their daughters with the HPV vaccine.

Your response to each question is very important and all responses will be anonymous.

These questions will help gather information about you and your background.

1. What is your gender?  1. Female  ρ  2. Male  ρ

2. What is your age?  __________

3. What is your highest level of education completed? (check one)
   1. Elementary (0 to 8 years)  ρ
   2. Some high school (1 to 3 years)  ρ
   3. High school graduate (4 years)  ρ
   4. Some college (1 to 3 years)  ρ
   5. College graduate (4 or more years)  ρ

4. What is your approximate yearly household income? (check one)
   1. Under $10,000  ρ
   2. $10,000 to less than $20,000  ρ
   3. $20,000 to less than $35,000  ρ
   4. $35,000 to less than $50,000  ρ
   5. $50,000 to less than $75,000  ρ
   6. $75,000 to less than $100,000  ρ
   7. $100,000 or more  ρ
5. What is your religious affiliation? (check one)
   1. Catholic
   2. Protestant
   3. Jewish
   4. Muslim
   5. Buddhist
   6. Christian
   7. None
   8. Other  Please specify_____________

6. How often do you attend religious services? (check one)
   1. Rarely or never
   2. A few times a year
   3. 1-3 times a month
   4. Once a week
   5. More than once a week

7. What is your marital status? (check one)
   1. Never married
   2. Married/Partnered
   3. Separated
   4. Divorced
   5. Widowed

8. What are the ages of your daughters? _________________
9. Do you have some form of health insurance? (check one)
   1. Yes  ρ
   2. No   ρ

10. Have any of your daughters ever received the HPV vaccine? (check one)
    1. Yes  ρ
    2. No   ρ

11. Has anyone close to you ever had cervical cancer?
    1. Yes  ρ
    2. No   ρ
Each question in this section refers to vaccinating adolescent daughters with the HPV vaccine. Circle the number that best represents your view about each statement.

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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I intend to have my daughter vaccinated with the HPV vaccine.</td>
<td>extremely unlikely</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>worthless</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>dangerous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>harmful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>good</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>6.</td>
<td>Having my daughter vaccinated with HPV vaccine means that I am allowing God to work through doctors to prevent illness.</td>
<td>strongly disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>7.</td>
<td>Allowing God to work through doctors to prevent illness is:</td>
<td>not important</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>6</td>
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<td>8.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>useful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
<td>unhealthy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>6</td>
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<td></td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
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<tr>
<td>10.</td>
<td><strong>advantageous</strong> 1 2 3 4 5 6 7 <strong>not advantageous</strong></td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>Having my daughter vaccinated with HPV vaccine means that I trust the drug company that makes the vaccine.</td>
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<td><strong>strongly disagree</strong> 1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
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<td>12.</td>
<td>Trusting the drug company that makes the HPV vaccine is:</td>
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<td><strong>not important</strong> 1 2 3 4 5 6 7 <strong>very important</strong></td>
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<td>13.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
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<td><strong>responsible</strong> 1 2 3 4 5 6 7 <strong>not responsible</strong></td>
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<td>14.</td>
<td>Vaccinating my daughter with HPV vaccine means I trust that the government has told people everything about the vaccine.</td>
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<td><strong>strongly disagree</strong> 1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
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<td>15.</td>
<td>Trusting that the government has told people everything about the HPV vaccine is:</td>
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<td><strong>not important</strong> 1 2 3 4 5 6 7 <strong>very important</strong></td>
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<td>16.</td>
<td>I will try to have my daughter vaccinated with the HPV vaccine.</td>
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<td><strong>extremely unlikely</strong> 1 2 3 4 5 6 7 <strong>extremely likely</strong></td>
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<td>17.</td>
<td>Having my daughter vaccinated with the HPV vaccine is:</td>
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<td></td>
<td><strong>pleasant</strong> 1 2 3 4 5 6 7 <strong>unpleasant</strong></td>
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<td>18.</td>
<td>Having my daughter vaccinated with HPV vaccine is not necessary because health and illness are determined by God’s will.</td>
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<td></td>
<td><strong>strongly disagree</strong> 1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
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<td>19.</td>
<td>God’s will has an effect on the extent to which a person is healthy or ill.</td>
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<tr>
<td></td>
<td><strong>strongly disagree</strong> 1 2 3 4 5 6 7 <strong>strongly agree</strong></td>
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</table>
20. I plan on having my daughter vaccinated with the HPV vaccine.

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<tr>
<th>extremely unlikely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

21. Having my daughter vaccinated with the HPV vaccine is:

<table>
<thead>
<tr>
<th>not important</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>important</th>
</tr>
</thead>
</table>
Appendix C

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

July 31, 2009

Jennifer Bryer
1678 Fenimore Road
Hewlett NY 11557

Dear Jennifer Bryer:

(Initial / Amendment / Continuation / Continuation w/ Amendment)

Protocol Title: “Black Parents Beliefs, Attitudes, and HPV Vaccine Intentions: A Mediation Model”

This is to advise you that the above-referenced study has been presented to the Institutional Review Board for the Protection of Human Subjects in Research, and the following action was taken subject to the conditions and explanations provided below:

Approval Date: 7/12/2009  Expiration Date: 7/11/2010
Expedited Category: 7  Approved # of Subject(s): 25

This approval is based on the assumption that the materials you submitted to the Office of Research and Sponsored Programs (ORSP) contain a complete and accurate description of the ways in which human subjects are involved in your research. The following conditions apply:

- **This Approval**- The research will be conducted according to the most recent version of the protocol that was submitted. **This approval is valid ONLY for the dates listed above;**
- **Reporting**- ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;
- **Modifications**- Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;
- **Consent Form(s)**- Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;
- **Continuing Review**- You should receive a courtesy e-mail renewal notice for a Request for Continuing Review before the expiration of this project’s approval. However, it is your responsibility to ensure that an application for continuing review has been submitted to the IRB for review and approval prior to the expiration date to extend the approval period;

Additional Notes: Expedited Approval per 45 CFR 46.110

Failure to comply with these conditions will result in withdrawal of this approval.

Please note that the IRB has the authority to observe, or have a third party observe, the consent process or the research itself. The Federal-wide Assurance (FWA) number for the Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Respectfully yours,

Sheryl Goldberg
Director of Office of Research and Sponsored Programs
geraser@orsp.rutgers.edu

cc: Charlotte Thomas-Hawkins
Attachment 4

Consent for Participation in Focus Groups

Title of Study: Black Parents Beliefs, Attitudes, and HPV Vaccine Intentions: A Mediation Model
Principal Investigator: Jennifer Bryer, RN, MS, CNE

You are invited to participate in a research study that is being conducted by Jennifer Bryer, RN, MS, CNE, who is a doctoral student in the College of Nursing at Rutgers University. This consent form contains information about the study and you will have an opportunity to ask questions about the study. You will then be asked to sign this consent form if you agree to be in the study. A copy of this form will be given to you to keep for your records.

The purpose of the study is to examine beliefs, attitudes, and HPV vaccine intentions among Black parents with pre-adolescent and adolescent daughters. Routine vaccination with the HPV vaccine is recommended for females between the ages of 11-12 years of age, with a catch-up vaccine for females between the ages of 13-26. This study will try to identify factors that influence HPV vaccine intention.

In order to participate in this study, you must be able to a) speak, read, and understand English, b) be a parent of a daughter between the ages of 9 and 17, and c) self-identify as Black/African American.

Approximately 25 persons divided into three focus groups will participate in this study. Your involvement in this study will consist of participation in a focus group lasting approximately 1½ hours. The study procedure is as follows:

- You will be part of a group of 6-9 parents that will be asked questions about your beliefs regarding medical treatments, general vaccines, and the HPV vaccine. The discussion will be audiotaped.

You will not receive any direct benefit for participating in this research, but the research may give healthcare providers a better understanding of the reasons parents intend or do not intend to vaccinate their daughters with the HPV vaccine.

There is no cost to you for participating in this research project.

Your alternative is to not participate in this study.

There are no foreseeable risks to participation in this study.

Page 1, Subject Initials _____

APPROVED

Date: 7/12/2009

EXPIRES

JUL 11 2010

Approved by the
Rutgers IRB
Title of the Study: Black Parents Beliefs, Attitudes, and HPV Vaccine Intentions: A
Mediation Model
Principal Investigator: Jennifer Bryer, RN,MS,CNE

Participation in this study is voluntary. You may choose not to participate, and you may
choose to withdraw at any time during the focus group session without any penalty to
you. In addition, you may choose not to answer any questions with which you are not
comfortable.

This research is anonymous. Anonymous means that I will record no information about
you that could identify you. This means that I will not record your name, address, phone
number, or date of birth. I will keep any information obtained in a secure location. The
research team and the Institutional Review Board at Rutgers University are the only
parties that will be allowed to see the data, except as may be required by law. If a report
of this study is published or the results are presented at a professional conference, only
group results will be stated, unless you have agreed otherwise.

If you have any questions about the study, you may contact Jennifer Bryer by email at
jbryer@pegasus.rutgers.edu or by telephone at 516-381-5069.
You may contact Jennifer Bryer by mail through the Department of Nursing at:
Rutgers, The State University of New Jersey
College of Nursing
180 University Avenue, Ackerson Hall
Newark, NJ 07102

If you have any questions about the study, you may contact Dr. Charlotte Thomas-
Hawkins by email at charlot@rutgers.edu, by telephone at 973-353-3864 or by mail at:
Rutgers, The State University of New Jersey
College of Nursing
180 University Avenue, Ackerson Hall, Room 109
Newark, NJ 07102

Page 2, Subject Initials ____
Title of the Study: Black Parents Beliefs, Attitudes, and HPV Vaccine Intentions: A Mediation Model
Principal Investigator: Jennifer Bryer, RN, MS, CNE

If you have any questions about your rights as a research subject, you may contact the Sponsored Programs Administrator at Rutgers University at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 732-932-0150 ext. 2104
Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this consent form for your records.

By signing below, you agree to participate in this research study:

________________________________________  ______________
Signature of Subject                      Date

________________________________________  ______________
Signature of Investigator                  Date

AUDIOTAPING
The focus group discussion described above will be audiotaped and any comments that you share with the group will be included in this audiotape. By signing below you are agreeing to the audiotaping of your comments.

________________________________________  ______________
Signature of Subject                      Date

APPROVED
Date: 7/12/09

EXPIRES
JUL 1 1 2010

Approved by the Rutgers IRB
October 15, 2009

Jennifer Bryer
1678 Fenimore Road
Hewlett NY 11557

Dear Jennifer Bryer:

Notice of Exemption from IRB Review

Protocol Title: “Black Parents Beliefs, Attitudes & HPV Vaccine Intentions: A Medical Model”

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

Exemption Date: 9/25/2009 Exempt Category: 2

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.

- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;

- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;

- **Consent Form(s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

Additional Notes: None

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Sheryl Goldberg
Director of Office of Research and Sponsored Programs
garser@orsp.rutgers.edu

cc: Charlotte Thomas-Hawkins
Attachment 4

You are invited to participate in an important study to obtain information about HPV vaccine beliefs, attitudes and intentions among Black parents with pre-adolescent or adolescent daughters.

Your participation is very important in helping healthcare providers gain a better understanding of the reasons parents intend or do not intend to vaccinate their daughter with HPV vaccine.

Attached you will find an anonymous questionnaire. This should take you approximately 20 minutes to complete. Your rights as a participant in this study are summarized on the reverse side of this letter.

Thank you so much for your time and participation in this important project. The information gained from this project may contribute to the development of interventions to increase the dissemination of HPV vaccine among pre-adolescent and adolescent Black females.

Sincerely,

Jennifer Bryer, RN, MS, CNE
Doctoral Candidate
Rutgers College of Nursing

APPROVED
Date: 9/25/09
Your Rights as a Questionnaire Participant

To ensure that your responses to the questionnaire remain anonymous, your name will not appear anywhere on the questionnaire. Anonymous means that I will record no information about you that could identify you. This means that I will not record your name, address, phone number, or date of birth. I will keep all completed questionnaires in a secure location. The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law.

If a report of this study is published or the results are presented at a professional conference, only group results will be stated, unless you have agreed otherwise.

*Responding to this questionnaire indicates your willingness to participate.*
Participation in this study is voluntary. You may choose not to participate, and you may choose to withdraw at any time during the course of completing the questionnaire without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

There are no foreseeable risks to participation in this study, which will take about 20 minutes to complete. You will not receive any direct benefit for participating in this research, but the research may give healthcare providers a better understanding of the reasons parents intend or do not intend to vaccinate their daughters with the HPV vaccine.

If you have any questions about the study, you may contact Jennifer Bryer by email at jbryer@pegasus.rutgers.edu or by telephone at 516-381-5069. You may contact Jennifer Bryer by mail through the Department of Nursing at: Rutgers, the State College of New Jersey, College of Nursing 180 University Avenue, Ackerson Hall Newark, NJ 07102

If you have any questions about the study, you may contact Dr. Charlotte Thomas Hawkins at 973-353-3864, by email at charlot@rutgers.edu or by mail at the address provided above for the Rutgers College of Nursing.

If you have any questions about your rights as a research subject, you may contact the Sponsored Programs Administrator at Rutgers University at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 732-932-0150 ext. 2104
Email: humansubjects@orsp.rutgers.edu

APPROVED
Date: 9/25/09
February 17, 2010

Jennifer Bryer
1678 Fenimore Road
Hewlett NY 11557

Dear Jennifer Bryer:

**Notice of Exemption from IRB Review**

**Protocol Title:** “Black Parents Beliefs, Attitudes, & HPV Vaccine Intentions: A Mediation Model”

The project identified above has been approved for exemption under one of the six categories noted in 45 CFR 46, and as noted below:

**Exemption Date:** 1/28/2010  
**Exempt Category:** 2

This exemption is based on the following assumptions:

- **This Approval** - The research will be conducted according to the most recent version of the protocol that was submitted.
- **Reporting** – ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;
- **Modifications** – Any proposed changes MUST be submitted to the IRB as an amendment for review and approval prior to implementation;
- **Consent Form(s)** – Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;

**Additional Notes:** None

Failure to comply with these conditions will result in withdrawal of this approval.

The Federalwide Assurance (FWA) number for Rutgers University IRB is FWA0003913; this number may be requested on funding applications or by collaborators.

Sincerely yours,

Sheryl Goldberg  
Director of Office of Research and Sponsored Programs  
e grasen@grants.rutgers.edu

cc: Charlotte Thomas-Hawkins
Attachment 4

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Sincerely,

Jennifer Bryer, RN, MS, CNE
Doctoral Candidate
Rutgers College of Nursing
Your Rights as a Questionnaire Participant

To ensure that your responses to the questionnaire remain anonymous, your name will not appear anywhere on the questionnaire. Anonymous means that I will record no information about you that could identify you. This means that I will not record your name, address, phone number, or date of birth. I will keep all completed questionnaires in a secure location. The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law.

If a report of this study is published or the results are presented at a professional conference, only group results will be stated, unless you have agreed otherwise.

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You may contact Jennifer Breyer by mail through the Department of Nursing at:
Rutgers, the State College of New Jersey, College of Nursing
180 University Avenue, Ackerson Hall
Newark, NJ 07102

If you have any questions about the study, you may contact Dr. Charlotte Thomas Hawkins at 973-353-3864, by email at charlo@rutgers.edu or by mail at the address provided above for the Rutgers College of Nursing.

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Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 732-932-0150 ext. 2104
Email: humansubjects@orsp.rutgers.edu

APPROVED
Date: 4/3/10
Curriculum Vitae

Jennifer Bryer

1956  Born April 21, 1956

1974  Graduated Walt Whitman High School, Huntington Station, New York

1977  Diploma in Nursing, Pilgrim Psychiatric Center School of Nursing, Brentwood, New York

1977-1982  Staff Nurse Neonatal Intensive Care Unit, North Shore University Hospital, Manhasset, New York

1993  Bachelor of Science in Nursing, Regents College, Albany, New York

1993-2006  Classroom/Clinical Instructor, Vocational Education and Extension Board School of Practical Nursing, Uniondale, New York


2003  Master of Science in Nursing Education, Molloy College, Rockville Centre, New York

2003-2004  Medical/Surgical Nurse, FirstMed Intermediate Care Center, Mineola, New York

2004-2006  Adjunct Professor, Molloy College, Rockville Centre, New York

2004-2006  Adjunct Professor, Adelphi University, Garden City, New York

2006-present  Assistant Professor/Chairperson of Department of Nursing, Farmingdale State College, Farmingdale, New York

2010  Humanpapilloma Virus Health Policy, accepted for publication, Policy, Politics, and Nursing Practice

2011  Doctor of Philosophy in Nursing Research, Rutgers University, Newark, New Jersey