FAMILY AND PEER COMMUNICATION AS DETERMINANTS
OF HUMAN PAPILLOMAVIRUS
VACCINATION UPTAKE

by

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A DISSERTATION

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ABSTRACT

The goal of this study was to better understand the influence of family and peers on HPV vaccination, illuminating specific influences of knowledge, family style, conflict as well as conversation. This study is one of the first in the field of communication addressing communication and vaccination uptake. Considering that much of people’s understanding about health and health practices comes from both personal experiences and personal experiences of others, this deficit is notable. The theory of reasoned action was used to guide this study. It proved helpful in examining the relationship between societal norms, attitudes, and intention to vaccinate. It was predicted that peer influence, family influence and increased knowledge would be positive predictors of HPV vaccination. However, none of the variables proved to influence HPV vaccination. Additionally, family style, conflict between family members, conversation as well as determining in what areas family and peers were most influential was addressed. A surprising finding was that individuals who had little conversation with their peers and families about HPV vaccination were most likely to vaccinate. Finally, the study examined in which areas peers and families were most likely to be influential in the individual’s decision making process. In rank order, individuals were most likely to be influenced in consumer situations, interpersonally, and last in health situations by their peers and family. These results demonstrate that health issues may still be considered private areas where input from others may be unwanted or unheeded.
**LIST OF ABBREVIATIONS AND SYMBOLS**

<table>
<thead>
<tr>
<th>Symbol</th>
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<tr>
<td>(a)</td>
<td>Cronbach’s index of internal consistency</td>
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<td>(\beta)</td>
<td>Beta score</td>
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<td>(t)</td>
<td>Computed value of a (t) test</td>
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<td>&lt;</td>
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INTRODUCTION

Over half of the population of the United States will contract a sexually transmitted disease at some point in their lives (Koutsky, 1997). While there are dozens of sexually transmitted diseases in existence, the human papillomavirus (HPV) is the most common sexually transmitted disease affecting people in the United States (Kaiser Family Foundation, 2008). HPV is far reaching, affecting adolescents, adults, and the elderly. HPV is the only known cause of cervical cancer and is the leading cause of genital warts among men and women (Centers for Disease Control, 2008). What makes this virus so challenging for health care professionals is that HPV is often asymptomatic; so that people unknowingly transmit the virus to their sexual partner(s). According to the Centers for Disease Control, over 20 million Americans already have the virus and over 6.2 million new cases of HPV are reported every year (2008). HPV infection is the most common sexually transmitted disease surpassing gonorrhea and chlamydia and is of increasing health importance due to its tie to genital and cervical cancers (2008). The increasing transmission of HPV in conjunction with HPV’s ties to genital and cervical cancers has elevated the importance of HPV to health care workers and health scholars. For communication scholars, it is not necessarily HPV that has elevated interest; rather, communication researchers are increasingly interested in communication about HPV and vaccination.
Although much is known about adult decision making about vaccines, there is little research that combines this unique demographic as well as analyzing their perspectives on HPV or HPV vaccination. Subsequently, having a better understanding of HPV and the vaccination designed to prevent HPV is relevant and necessary. Additionally, the field of communication has yet to rigorously study the human papillomavirus. Understanding communication’s influence on HPV vaccination uptake is particularly relevant considering that peer and family communication may play a significant role in an individual deciding whether to vaccinate against the human papillomavirus.

This study seeks to explain if family communication styles and/or peer communication influence one’s intention to vaccinate. Additionally, understanding one’s attitudes about the HPV will be assessed in order to better understand what information has been communicated or has not been communicated about the HPV between families or peers.

Gardasil

On June 29th 2006, the Advisory Committee on Immunization Practices (ACIP), an advisory body to the Centers for Disease Control and Prevention (CDC), voted to recommend Gardasil, developed to prevent transmission of the human papillomavirus. Gardasil, developed by Merck Frosst Inc., is designed to protect against four strains of the one hundred strains of HPV, strains 6, 11, 16, and 18. These particular strains cause 70% of cervical cancer cases in women as well as 90% of genital warts in both men and women. About 20 million people in the US are infected with HPV, and about 6.2 million more get infected each year. Every year in the US about 10,000 women contract cervical cancer. 3,700 die. It is the second leading cause of cancer deaths among women around the world (Centers for Disease Control and Prevention, 2008). Since June 8, 2006, when the Federal Drug Association licensed Gardasil, more than 16
million doses of the Gardasil vaccine have been distributed in the United States (CDC, 2008). The vaccine consists of three doses. This number would insinuate that over 5.3 million women have been vaccinated against the HPV. At this time, the US does not have a national registry for immunization and vaccination; therefore there is not a composite number of people who have received Gardasil. By the end of 2006, Gardasil had been approved in 49 countries worldwide (Parry, 2007, ¶ 8).

HPV is contracted by skin to skin contact. Using condoms may decrease the chances of contracting HPV but HPV can still infect areas that are not covered by a condom. The only certain way to prevent HPV is to abstinence. Considering that condoms are not completely effective and that condoms are one of the most widely used barriers to prevent unwanted pregnancy and sexually transmitted diseases, Gardasil, is particularly important. The vaccine is given as a shot with three doses, given at one, three, and six month intervals following the initial shot. The vaccine is recommended for young girls from the ages 11 to 12 years old; however, it has been approved for women from the ages of eight to 26. The vaccine was designed for young women between the ages of 11 and 12 because there is an assumption that they are not yet sexually active, thus protecting them against the four strains.

Although Gardasil is effective at preventing contraction of the virus, those who sexually active before being vaccinated may already have contracted the virus. Gardasil is not effective for the treatment of current cases of HPV. Additionally, there is no vaccine available for men until further studies can be conducted by the FDA. Australia is currently conducting clinical trials to determine the efficacy of Gardasil in preventing the transmission of HPV to women as well as reducing the occurrence of genital warts in men (Tarala, 2008). While the vaccine is currently publicized to prevent cervical cancer as well as genital warts in women, men are also...
affected by this virus. Anal cancers as well as penile cancer are also potential effects of HPV contraction although the chances of men contracting these diseases due to HPV are much smaller than the chances of women contracting cervical cancer from HPV (CDC, 2008).

As prolific and potentially painful as HPV had become, the general public knew little about HPV prior to 2006. One possibility for a lack of public knowledge about HPV before 2006 is that there was little media coverage about HPV. While HPV and Gardasil are now frequently in the public eye, one of the most prevalent early media campaigns about HPV was Gardasil’s main marketing campaign called, “I want to be one less.” The commercials focus on women and their obligation to tell someone that HPV is the leading cause of cervical cancer in women and that a vaccine is available to decrease their chances of getting cervical cancer. The primary claim of the advertisement is that most women are unaware of the link between HPV and cervical cancer (Gardasil website, 2008). However, the campaign does not mention how HPV is transmitted, that it is a sexually transmitted disease, that condoms are often ineffective at stopping transmission, or any of the symptoms of HPV other than cervical cancer. The advertisement is framed as a public service announcement but is, in reality, a commercial for Merck’s vaccine.

**Opposition to Gardasil**

Although the vaccine increases a person’s ability to avoid cervical cancer and/or genital warts, there are concerns about the vaccine. HPV vaccination concerns fall roughly into three categories: logistic obstacles, health concerns, and ethical dilemmas. First, HPV vaccination raises concerns regarding the simple logistics of the vaccine because of the potential cost to the individual and the state. First, Gardasil may not be cost-effective. The average cost of the vaccine is 120 dollars per shot with three visits mandatory for effectiveness. It has proven that
missing or not receiving the vaccine in the timeline recommended by the CDC will result in
lessened protection against HPV (CDC, 2008). Although many insurance companies are paying
for the vaccine, coverage is not universal. Additionally, vaccination guidelines are not dictated
by the federal government. States individually determine what vaccinations are required and
which vaccines are available for those who need public assistance. In addition to Gardasil not
being cost effective for an individual, Gardasil may not be cost-effective for states and state
agencies.

Ignorance surrounding the virus is also far-reaching. Men (Partland, Weaver, Lee, &
Kousky, 2000), women (Mays, Zimet, Winston, Kee, Dickes & Su, 2000), and adolescents
(Cothran & White, 2002) often have little knowledge concerning the transmission, treatment, and
prevention of HPV. Considering that HPV is more often asymptomatic in men than in women,
many men pass on the disease to their partners without knowing that they are infected. There is a
gross lack of knowledge about most sexually transmitted diseases, but the HPV is especially
misunderstood; it is asymptomatic and easily transmitted.

Second, HPV vaccination is prompting concern about the health and safety of the vaccine
because of the efficiency research regarding Gardasil is incomplete. According to the Food and
Drug Associations fact sheet online (2006) Gardasil is 95 to 100 percent effective against HPV
strains 6, 11, 16, and 18. Dr. Richard Haupt, executive director of medical affairs in Merck's
vaccine division stated, “We are doing further tests and follow-up. But right now, we know it is
effective for five years" (Lopes & Dolan, 2007, p. A1). After five years booster shots may be
necessary in order to continue Gardasil’s effectiveness. Research has found that Gardasil is
most cost-effective when the vaccine is given to young girls. This assertion is made because the
300-400 dollar investment could prevent thousands of dollars that may be paid by the
government if a woman develops cervical cancer. If a woman is older, there is a much higher chance she would have already contracted the disease and the 300-400 dollar investment may be made in vain (Lopes, 2008).

There are also considerations about the safety of the vaccine. There is concern that the vaccine is a new product which means that long term testing has not been completed. *The National Post* of August 7th, 2007 reports that

Merck Frosst, which produces Gardasil, says its clinical trials followed 20,000 females for an average of 3.5 years; only 241 subjects were followed for five years, and no one for longer. The youngest girls were followed for only 18 months; only 100 nine-year-olds were included. This group is assumed not to be sexually active or infected, when neither may be the case. Many types of HPV infection have been demonstrated in children, even in newborns (p.2)

These health concerns are roadblocks to widespread HPV vaccination. Many parents feel that their child should not be vaccinated until further and more rigorous research has been conducted regarding the long-term implications of this particular vaccination. Because the vaccine has only been approved by the Food and Drug Administration for only two years, trials conducted in the United States are not long term. In fact, when pressed, Merck is uncertain as to how long the vaccine will actually prevent HPV. They admit that booster shots will be necessary in order to increase the time that the vaccine will be effective. There are also many other concerns focused on the lack of time that Gardasil has been on the market. However, these concerns are prevalent for all new vaccinations and are not just related to Gardasil. These potential concerns include thinking that the vaccine will actually cause infection in those who HPV vaccination is trying to protect as well as the vaccine causing other diseases or ailments.
Finally, HPV vaccination has created a whirlwind of controversy focusing on the moral implications of such a vaccine. There are concerns that the vaccine will increase the likelihood that adolescents engage in premarital sex. Because the vaccine not only prevents cancer but genital warts as well, many adults, particularly those in conservative family groups (Colavecchio-Van Sickler, 2007) feel that the vaccine will promote sexual activity among teens and sex outside of marriage (Maher, 2006). In other words, one of the conventional means for persuading teens to abstain from sexual activity is by focusing on the threats to sexually transmitted diseases. Opponents to the vaccine fear that the vaccine renders the threat of STDs and pregnancy less potent (Colavecchio-Van Sickler, 2007).

Additionally, proposed legislation making vaccination against HPV mandatory for girls in elementary school has caused controversy. When it is deemed mandatory for a child to receive a HPV vaccination in order to attend public schools, there are issues created about parents having the legal ability to address their own concerns and beliefs about the vaccine. In most states, parents are allowed to opt their child out of vaccination but only if it conflicts with their religious beliefs about vaccination. By only having a religious opt out clause, parents who have concerns that are not religiously focused are still expected to vaccinate their children. Additionally, if Gardasil were to be made mandatory in a state, funding would be made available for those for whom purchasing the vaccine would be a financial burden. However, issues such as paying the actual person to administer the vaccine as well as issues such as transportation and a parent taking off work to take a child to the doctors are not covered by such funds.

Choosing to Vaccinate

There are a multitude of reasons that can explain why individuals do not vaccinate. There are two primary categories of people who choose not to vaccinate: those that disapprove of all
vaccines and those who oppose only some vaccines. First, there are a growing number of adults who are choosing to shun all vaccinations for their children or choosing selectively to vaccinate (Steinhauer, 2008). Additionally, many parents have had negative experiences at doctor appointments when their children were vaccinated, and this negative experience may translate to a lack of desire to have their children get vaccinated against other diseases or illness. This could range from a long wait in the waiting room to having their children cry excessively due to the pain of shots. Second, individuals may only choose to avoid particular vaccinations. This consideration is also impacted by the proliferation of media coverage surrounding new vaccines. New information may lead to confusion or the creation of misperceptions.

Communication

Family Communication Styles

The study of family communication styles originated with studies by Fitzpatrick and Ritchie in 1990 in which they began to examine different styles of communication found within families. They developed the family communication style scale which measures a family’s need for all members to conform as well as the degree of openness to different topics of conversation. Simply, this scale examines the need for everyone to share the same opinion and a family’s ability and comfort with discussing a broad range of topics. After conformity and socio-orientation is tested, families’ communication can categorize families into one of four types. Each type of family has particular patterns of communication which would influence the topic of conversation as well as if topics such as HPV would even be discussed. This categorization of families allows the researcher to determine if there is a correlation between the type of family communication and a research subjects potential discussion about the topic as well a family’s potential need to conform to their beliefs about HPV vaccination.
Peer Communication

Current research on peer communication has found that peers greatly influence adolescents' decision making (Maxwell, 2002). Researchers have found that adolescents may be more comfortable talking to their peers about sensitive sexual issues than to their parents (Di Iori, Kelley, & Hockenberry-Eaton, 1999). This may include such topics as sex, birth control measures, as well as information about smoking and drinking. By analyzing peer communication it is possible to determine the extent of peer influence regarding HPV vaccination as well as what kinds of influence is exerted.

Communication about HPV and sex

Although HPV has only had a brief time at the forefront of discussion, communication about sexually transmitted diseases has been studied. Because a person's actions cause sexually transmitted diseases and because the actions themselves are sexual, the rhetoric surrounding public health information and treatment for STDs is different than a disease that is not caused by one's actions. Additionally, there are numerous variables concerning parent-child communication about sex. Influences such as sex of the parent and openness of the discussants would directly influence what topics are discussed and how they are discussed.

Theory of Reasoned Action

This paper is guided by the theory of reasoned action. The basic premise of this theory is that attitudes about a topic plus subjective norms equal intentions which are the most accurate prediction of behavior. This paper addresses both attitudes about the HPV as well as the subjective norms which are made up of a person’s idea of what others think of them. Because this paper focuses on attitudes surrounding HPV vaccination as well as peer and family influence, the theory of reasoned action is an appropriate theoretical framework.
Issue

HPV and vaccination processes are relatively well understood in the fields of biological and health sciences, the field of communication has the potential to greatly affect what scientists, researchers, and the general public understands about HPV and HPV vaccination. Currently, research on vaccination is limited to understandings of adult vaccination and vaccination of children. Vaccination against HPV amongst college students is a unique phenomenon. Gardasil is the first vaccine that will guard against a sexually transmitted disease. What complicates HPV vaccination even further is that the target age for vaccination is pre-teen, teenage, and college-aged adolescents who are able to vocalize their vaccination preference unlike the vaccination process for vaccination of children. Children are forced to acquiesce to their parents’ wishes because they are minors; most college-aged students are able to make their own health related decisions. The timeliness of this issue is obvious with numerous advertisements seen on television, women’s magazines including those read by young women, and print advertisements. Gardasil is one of the most mediated vaccines of current times.

Although HPV vaccination has had much media coverage, acceptance of vaccination is not necessarily correlated. Traditionally, vaccination has fought a battle with public opinion. The average individual has little medical knowledge and is often skeptical of the medical community. Many individuals are skeptical of the medical community has stemmed with negative experiences or simply not understanding the medical language used by health professionals which increases frustration and misunderstandings. Ramsay (2002) found that media coverage directly impacts effects the public’s willingness to vaccinate. In his study, he found that when the media focused on the measles, mumps, and rubella vaccine people were more willing to vaccinate; however, with decreased coverage, vaccination rates also decreased.
In general, society’s lack of knowledge about vaccinations and their benefits often prevents individual acceptance and reception of vaccinations for a large part of the population. However, the concept of herd immunization stresses that, in many cases, all or most of society must be vaccinated or those who are not vaccinated will continue to infect the rest of the population rendering the vaccinations less effective. When vaccinating against HPV herd immunity is especially important considering that such a high proportion of the population will contract the virus at some point in their lives.

Although much of Gardasil’s target population, adolescent females, can legally make their own decisions regarding vaccination, parental involvement often factors into decision making regarding Gardasil. In their 2004 study, Mays, Sturms, and Zimet asked participants, all parents, if they would be willing to vaccinate their children against HPV, HIV, genital herpes, and/or gonorrhea. Most parents said that they would vaccinate their children against all of the diseases. Participants were asked to rank each disease in the order of importance to which they would vaccinate their children. HPV was the least accepted vaccination. HIV was the most accepted vaccination. Children’s low risk of acquiring the disease and low concern for the disease’s symptoms were the primary rationales for not wanting to vaccinate their children against HPV, although children’s risk for disease acquisition is much higher for contracting HPV than for contracting HIV/AIDS. Further, parents who were of low socio-economic status were most likely to want their children vaccinated against sexually transmitted diseases. One reason Mays et al. cited for the resistance to the HPV vaccine by parents was a lack of knowledge about the disease. Mays, Sturms and Zimet’s study suggests, then, that the more people know about a sexually transmitted disease, the more likely they will be willing to vaccinate.
This unique age group and HPV vaccination are relatively unstudied in the field of health communication. The field of communication can offer practical information on how family and peer influences factor into HPV vaccination-related decision-making among young adults. It is well known that adolescents are influenced by peers and family influence; however, it is conceivable that adolescents may not discuss the HPV vaccine with their family and friends because it is associated with sexual activity and therefore, potentially embarrassing (Jaccard, Dittus, & Gordon, 2000). Because young adults are not minors, they are able to receive the vaccination without parental consent by simply paying for the three-part vaccination themselves. It is necessary to understand if, and to what extent, family and peers impact HPV vaccination as well as other health-related decision-making issues. Simply, scholars have ignored this phenomenon; this study examines HPV and the unique audience targeted by HPV vaccination.

Purpose and Preview

Understanding how communication influences intention to vaccinate against HPV will provide a unique window into how college-aged students make decisions about their health. This study relies on the theory of reasoned action to better understand societal norms and attitudes in order to predict behavior. To accomplish these goals, Chapter 2 discusses relevant literature. This includes both literature about the theory of reasoned action and communicative variables such as peer and family communication. Chapter 3 discusses the methods chosen for this study. Chapter 4 offers results of the analysis. Finally, Chapter 5 poses theoretical implications of the study and theoretical background of this study and offers an overall assessment of the study’s conclusions and findings.
LITERATURE REVIEW

Deciding to vaccinate is often a decision with multiple considerations. This may include a variety of practical factors such as cost, access, and availability, but there are also social factors to consider including rules and regulations, rumors about vaccination, and family norms regarding vaccination.

This study is not the first to explore the role of communication and vaccination. In order to understand the unique considerations of this investigation into communication and HPV vaccination, it is important to first examine current communication research about vaccination uptake in general. Depending on the type of vaccination, there may be moral or behavioral considerations. Insurance may cover or deny the vaccination. Social peers may support, ignore, or disagree with a vaccination decision. In order to better understand HPV vaccination uptake, it is necessary to explain the theory of reasoned action in addition to how it benefits this study, previous research around vaccination in general, family communication styles, and peer communication. Based on the review of literature, I then propose the hypotheses and research questions that guide this inquiry.

Theory of Reasoned Action

Attempting to predict an individual’s future behavior is difficult, if not impossible. Free will, societal expectations, and volitional control are all potential confounding factors in determining if a person will perform an action, what action a person will perform, when, and to what extent they will perform it. Considering that the ability to predict behavior greatly influences many situations, everything from voting patterns to healthcare choices to marketing
perspectives, the link between intention and behavior is important to understand. Being able to predict behavior allows communication scholars to better the effectiveness of health campaigns, determine motivations, and to understand how to best interact in interpersonal dyads. In 1967, Martin Fishbein first introduced the theory of reasoned action, although it is best known in its 1975 version. In 1975, Icek Ajzen and Martin Fishbein joined and began to explain how to determine an individual’s actions through their theory of reasoned action (Fishbein & Ajzen, 1975). The fields of marketing, psychology, advertising, and, to the greatest extent, health communication have adopted the theory in order to predict behavior. The theory of reasoned action takes into consideration a person’s attitudes about the behavior and the potential influence of societal norms.

This theory has been met with acclaim and criticism, becoming one of the most popular individual level theories utilized in health communication research, along with the health belief model, and theory of planned behavior, which is an extension of the theory of reasoned action. The field of persuasion has also widely accepted the theory (Viswanath, in press). Although application of the theory has been widespread, there has been only one large meta-analysis of the theory of reasoned action (Sheppard, Hartwick, & Warsaw, 1988), and this analysis is nearly 20 years old.

**History of the theory of reasoned action**

Icek Azjen and Martin Fishbein had been separately conducting research on attitude and behavior at the University of Illinois before they joined forces and began to work collaboratively. Unhappy with previous approaches that linked intention with behavior; they proposed an alternative theory and later theories that closely link intention and behavior.
Although the authors’ history assists in explaining the creation of the theory, a clearer history of the theory can be found by looking more broadly at how the theory is situated in the history of intention and behavior. Rice and Atkin (2002) stated that the theory of reasoned action is “derived from expectancy-value theory, which postulates that one’s beliefs about the likelihood that a given behavior leads to certain consequences, multiplied by one’s evaluation of those consequences is likely to predict values and behaviors” (p. 433). Martin Fishbein has been credited with developing expectancy value theory. Expectancy value theory is different than the theory of reasoned action due to expectancy value theory focusing more on internal cognition and less focus on the testing of the behavior. The theory of reasoned action elaborates upon this theory by considering societal norms and their influence on behavior.

The theory of reasoned action has been applied in a wide variety of topics including potential coupon usage (Shimp & Cavas, 1984), women’s intentions to breastfeed their infants (Manstead, Profitt, & Smart, 1983), to analyze moral behavior (Vallerand, Deshaies, Cuerrier, Pelletier, & Mongeau, 1992), organ donation (Weber, 2006), and hundreds of other studies. Obviously, the theory of reasoned action has been used to study diverse topics from health care to analyzing less tangible ideas such as moral actions. The theory of reasoned action is used explain behavior by taking into account our family and peers influence as well as our own attitudes about a given topic. The theory of reasoned action measures intention which, according to Ajzen and Fishbein, is the best predictor of someone’s intention, in this study, to vaccinate.

The theory of reasoned action proves relevant to the study of human papillomavirus vaccination acceptance because of subjective norms as well as attitudes and beliefs. First, the study of subjective norms proves particularly relevant because, as previously discussed, the HPV vaccine is controversial because of HPV’s sexual transmission. There is obvious stigma against
those who have sexually transmitted diseases. Parents and peers would prove pivotal in decision making. If a person who is concluded in someone’s subjective norm were to criticize the vaccine, that conversation could drastically alter someone’s opinion on the vaccine. No one wants to be thought of as promiscuous or to have the need to be vaccinated.

Additionally, attitudes and beliefs would be important considerations for someone considering HPV vaccination. Attitudes and beliefs about the HPV would affect vaccination uptake. A person with negative attitudes would be less likely to vaccinate, especially if a person’s subjective norms opposed the vaccination. If a person has a negative attitude about HPV plus a negative reaction from a person’s significant norms would decrease intention would mean a decrease of action.

With increased media coverage and discussion about the vaccine, it has become easier for people to form attitudes about HPV vaccination due to its prevalence in society. If a person feels at risk for contracting HPV or feels particularly at risk for cervical cancer, his/her attitudes will be formed accordingly. Because beliefs are value-laden concepts, the moral implications for vaccine acceptance would lend itself to testing. Using the theory of reasoned action as a guide to studying peer and family communication about the HPV would be logical.

**Conceptual Framework**

Azjen and Fishbein (1980) state that their theory’s “ultimate goal is to predict and understand an individual’s behavior” (p. 5). At its base, the theory has the underlying principle that the simplest way to determine a person’s behavior is to ask whether or not they were planning to perform a behavior, which determines their intentions. With this understanding, they explained two primary factors that influence an individual’s intention to perform an action that leads to the intended behavior: attitude and subjective norms. First, they define the term
“attitude” as “a person’s evaluation of any psychological object” (p. 28). Fishbein (2007) states that “the more one believes that performing a given behavior will lead to positive outcomes and/or will prevent negative outcomes, the more favorable will be one’s attitude toward performing that behavior” (p. 2). A person evaluates whether or not a behavior will be beneficial or the least negative, and that constructs their attitude on the given behavior. People’s attitudes toward a behavior are determined by their salient beliefs. According to Azjen and Fishbein (1980), salient beliefs are a small amount of beliefs that a person can attend to at any given time. Simply, a person cannot attend to many beliefs at a given time. Second, considering subjective norms is the second component of the theory of reasoned action. The authors define subjective norms as “the person’s beliefs that specific individuals or groups thinks he [sic] should or should not perform the behavior and his motivation to comply with the specific referents (p. 8). The authors further explicate subjective norms as “the more a person perceives that others who are important to him perform a behavior, the more he [sic] will intend to do so” (p. 57). Individuals consider subjective norms when determining their actions. The key to this definition is that Azjen and Fishbein focus on a few individuals’ influence on the person’s intention to perform a behavior. They are not talking about society at large as an indicator of potential behavior, only a few people close to the individual. Finally, the authors discuss behavioral intention “as the likelihood that a person will engage in a given behavior” (p. 42). Behavioral intention is the intention to perform a specific act after attitude and subjective norms have influenced the individual.

With attitude toward the behavior and subjective norms influencing behavioral intention, the final component of the theory is the actual behavior. The behavior can either be what a person expressed they were going to do or an opposite behavior, such as stating they were going to purchase a particular product such as a type of soda and then instead purchasing another type or not purchasing a soda at all. Fishbein and Ajzen’s overall premise is that the behavioral intention is the most likely indicator of future behavior.

When considering a person’s general attitude towards the behavior and the person’s subjective norm concerning performing the behavior, the theory can be expressed simply as an equation: \( B-I = w_1AB + w_2SN \), where \( w_1 \) and \( w_2 \) are weighted indicating the importance of attitudes (AB) and subjective norms (SN) as determinants of behavioral intention (BI) (Fishbein, 2007). It is important to consider the weights (\( w_1 \) and \( w_2 \)) because different people may be influenced by different factors. For example, one person may be very concerned with subjective norms and another might not at all be influenced by norms. The theory of reasoned action predicts behavior based on a person’s attitudes about a behavior and a person’s desire to stay within societal norms.
Research Approaches

The theory of reasoned action has been tested primarily through the use of questionnaires and self-report. Ajzen and Fishbein (1980) suggest that questionnaires are easier and more cost-effective to use. They also state that direct observation of a behavior is the best way to analyze the link from intent to behavior, but, due to privacy issues, would not always be appropriate especially in health related situations. Azjen gives guidelines on his website how to design a questionnaire using the theory of planned behavior (2007). Although the theory of planned behavior has some differences from the theory of reasoned action, they are similar enough to argue that the authors would suggest the use of questionnaires for the theory of reasoned action. Volitional control or voluntary behavior is also tested quantitatively in the theory of planned behavior. Thus, the theory of reasoned action lends itself to quantitative analysis, due to the increased time and energy required for actual testing of whether the intention leads to the expected behavior.

The theory of reasoned action has been used in numerous studies which measured intention to engage in health related decision making. The theory of reasoned action is an appropriate lens to understanding HPV vaccination intention for two reasons; first, the goal of this study is to determine intention to vaccinate. Second, the theory of reasoned action is appropriate because this primary goal of this study is to better understand family and peer influence on vaccination and family and peers would count as subjective norms. Thus with this justification, specific literature focused on vaccination and peer and family influence is addressed.
Vaccination

Smailbegovic, Laing, and Bedford (2003) found that the one popular rationale for not vaccinating children was fear of the vaccines’ safety and side-effects, although time constraints and inadequate information were also popular reasons to not vaccinate. Additionally, Mays, Strurkm, and Zimet (2004) focus on parental decision making. They conducted a qualitative study in which they asked parents in an urban clinic and parents at a suburban doctor’s office whether, if they had the opportunity, they would vaccinate their child against gonorrhea, AIDS, HPV, or herpes. The study found that close to 70% of parents would choose to vaccinate against all four sexually transmitted diseases. The rationale behind the other parents’ decision not to vaccinate included a lack of disease-specific knowledge and low concern about the disease. They also found that parents who were less-educated and poorer were more likely to want to vaccinate their children. The researchers believe that the parents interviewed in the urban clinic were exposed to more people who had a sexually transmitted disease and thus believe that their children were at risk. Parents from the suburban clinic believed that their children were not at risk and did not need to have the vaccinations.

Also, there is often a fundamental lack of knowledge about all vaccines. While vaccination is required for school aged children who attend public schools as well as recommended for adults to prevent tetanus and influenza, people often feel that they know very little about vaccination and how vaccination works. Lewis-Parmar and McCann (2002) found that when physicians provide information about the influenza vaccine in addition to recommending the vaccine to elderly patients, patients were more likely to vaccinate. Although this study focused on elderly patients, lack of information about vaccination may be one of the leading causes of low vaccination uptake among all demographic groups. Lack of knowledge
has been negatively linked to health care workers willingness to vaccinate (Canning, Phillips & Allsup, 2005). In Bertram and Niederhauser’s (2008) study, they found that amongst their student participants, there were low levels of knowledge about HPV and many topics concerning HPV such as pap smears were misunderstood. Obviously, lack of knowledge influences a variety of vaccinations and many demographics.

*Adolescent Vaccination Decision Making*

Clearly much of the literature on vaccination uptake deals with parental decision making concerning vaccination for their children. Because most vaccines are given while children are in the care of their parents, few studies address vaccination decision making considerations among adolescents and college age students. The little information that is available deals primarily with individual characteristics that makes an adolescent decide to vaccinate as opposed to societal considerations. Vaccination is not a popular topic due to the lack of vaccinations specifically geared to teenagers and young adults.

Currently there is a lack of literature studying HPV vaccination, but other communicable diseases are comparable due to the availability of a preventative vaccine and the same target demographic. During a campus-wide meningococcal meningitis vaccination campaign, Paneth, Kort, Jurczak, Havlichek, Braunlich, Moorer, Vamderjagt, Sienko, Leiby and Gibbons (2000) found that women were more likely to be vaccinated, whites and Asians were more likely to be vaccinated than African Americans or Latinos, and younger students were more likely to be vaccinated than older students, which the authors attribute to parental influence. Bohner, Howe, Bernstein, and Rosenthal (2003) determined that college students would be more likely to accept a vaccine that guards against the HPV as the number of sexual partners they had increased, if they felt that their parents would encourage vaccination, if the vaccine was safe and inexpensive,
and if they endorsed the belief that universal vaccination for HPV was good. Vaccination is obviously a complicated decision

Communication

Family Communication Styles

Cline (2003) observes that the study of communication and health has focused on formal communication instead of informal contexts, such as a discussion at a doctor’s office instead of discussion around a family’s dinner table. Further, he argued that when informal contexts have been studied, the focus has been upon mass communication instead of interpersonal communication. However, the study of informal contexts is necessary in order gain a clear understanding of how health messages are created and carried out within the group of people who are often most influential. With this justification, it becomes clear that family communication is of great importance in understanding health behaviors.

Family communication is an influential variable in understanding how adolescents make health-related decisions. Wilkes (1986) found that adolescents rank their parents, not peers, as the people most important in their life. Since family relationships are the first primary relationships that an individual makes as well as being undoubtedly influential relationship, it makes sense that family members are most important to an adolescent. This can also be considered in a more practical standpoint. Parents can provide monetary support as well as housing and food which might also influence their importance ranking. However, just because parents are the most important people in an adolescent’s life does not necessarily insinuate that parents are always the most influential. During adolescence, many teens spend most of the day with their peers at school. During the college years, students may not see their families for days, weeks, or even months. Because families may not be available for immediate, face-to-face
contact, peers may be an especially important influence of adolescent decision making. Further, in relation to health decisions, peers may be particularly influential because they are going through the same health related issues such as receiving a meningitis vaccination, or contracting athlete’s foot from communal showers. Issues that families may be far removed from.

In order to understand how family communication styles would influence health decisions related to sexual behaviors and health it is necessary to define and understand these styles and what classifies each subset. According to Koerner and Fitzpatrick (2004), there are 2 dimensions of family communication:

1. Concept-orientation is a construct determined by the breadth of conversational topics and the degree of openness within a family’s communication.

2. Socio-orientation is a construct that addresses the conformity within a family. This is determined by the degree in which a child is expected to conform within the communication within the family, such as always obeying the parents or being allowed to debate with family members.

These classifications directly link to the four types of family communication (Koerner & Fitzpatrick, 2004):

1. Pluralistic families score high on concept-orientation but low on socio-orientation. Children are allowed to disagree, communication is open, and the breadth of topics is wide.

2. Protective families score low on concept-orientation but high on socio-orientation. There is little breadth to conversations in this type of family and children are expected to obey their parents without question.
3. Consensual families score high on both concept-orientation and socio-orientation. Discussion is promoted in this type of family but in the end it is important that a singular decision is made.

4. Laissez-faire families score low on both concept and socio orientations. This type of family has few consistent communication patterns. These families may not converse frequently and parents may be disinterested in their children’s thoughts and ideas.

To measure these patterns, Koerner and Fitzpatrick developed a 26-item self-report questionnaire called the Revised Family Communication Patterns Instrument. The original questionnaire was developed by Fitzpatrick and Richie in 1990. The questionnaire analyzes both conformity orientation as well as conversation orientation. Conformity orientation is the degree to which families feel the need to conform or share one opinion. In families which have high conformity orientation, children would be expected to obey their families and follow their parents’ rules. Conformity orientation has been seen to affect communication patterns in family communication. Koerner and Cvancara (2002) determined that families with high conformity were likely to give more advice in conversation as well as ask frequent questions. Families with low conformity were found to use more confirmation, acknowledgement and reflection in their conversations. Conversation orientation means the degree to which families easily communicate as well as the breadth of topics discussed. A family with high conversation orientation would communicate easily about a variety of topics and there would be very few topics that were not appropriate to discuss. Koerner and Fitzpatrick’s instrument has been used to better understand a variety of family concerns including college adjustment and need for independence (Orrego & Rodriguez, 2001), parental confirmation and affection (Schrodt, Ledbetter & Ohrt, 2007), pressure to conceal secrets (Afifi & Olson, 2005).
In 2005, Dong found that open family environments do not prevent young adults from performing risky behaviors. He also found that children who come from families that privilege conformity tend to engage in risky behavior more often than those who do not. Just because a family discusses a wide range of topics does not mean that the children will conform and just because a family longs for conformity does not mean that the child will behaviorally conform. Family communication style has profound and direct influence on a children and adolescents behavior and how they interact with their parents.

*Communication about Sex*

With this understanding it becomes clear that family communication has profound influence on the breadth of communication and how important reaching a consensus is, thus the link between family communication styles and a child’s sexual health and choices becomes clear. Miller, Kotchick, Dorsey, Forehand and Ham (1998) determined that the more open children perceive their parents to be, the more open the conversation and hence less risky behaviors take place. Boothe-Butterfield and Sidelinger (1997) determined that college students avoided irresponsible behaviors such as underage drinking more often when they were a part of a family in which there was open communication about a variety of topics. Most importantly they determined that that parents and children’s attitudes regarding sex and drinking were positively related to their children’s attitudes about the issues. It is important to acknowledge that “parents had slightly more conservative attitudes than their children, but the attitudes were directionally reflecting of each other” (p. 303). Obviously parental communication is related to a child’s health related behaviors including decisions about sexual health. Everyday interactions among family members have the potential to have a tremendous impact on individuals’ construction of health, talk about health, participation in healthcare systems, enactment of healthy or unhealthy
behaviors, and health status (Bylund & Duck, 2004). Miller, Kotchick, Dorsey, Forehand, and Ham (1998) determined that parents were more likely to talk to their children about HIV and sexually transmitted diseases than about sexual behavior or condom usage. The authors also found that adolescents were more likely to talk to their mothers about sex than their fathers. Further, it was found that daughters rarely discuss sex with their fathers. Whitaker and Miller (2000) argue that a lack of communication with parents about sex causes adolescents to turn to their peers for information.

Peer Communication

Before children begin formal schooling, parents are the primary socializing agents in children’s lives. With the advent of education, peers begin to actively influence a child’s decisions and actions. It is well known that peers are particularly influential concerning decision making in adolescents. Wilkes (1986) found that although parents are ranked most important in an adolescent’s life, problems are more often discussed with peers. Adolescents are particularly susceptible to influence from their friends because of the considerable attitudinal and behavioral similarity between them and their friends (Billy & Udry, 1985). Although there is no doubt that peers influence decision making, there is currently no standard scale which reliably determines the extent to which peer influence affects a person’s decision making regarding health and health care. When measuring peer influence, authors often create questions tailored to their own personal study that measures the influence. It is important to address the use of social influence scales. These scales are useful for many studies due to their expansive possibilities of social influence including peers, parents, siblings, extended family, employees etc. However, social influence scales are often written broadly to include many different types of relationships or are
not specific to how they define peer. This study is seeking to analyze solely peer and family influence hence, this genre of scales is inadequate for this study.

When reviewing the literature on peer influence it becomes apparent that much research focuses on risky behaviors such as teen drinking and underage smoking. However, there is little research regarding behaviors that are not heavily mediated or widely discussed. Scales that examine adolescent smoking and peer influence (Urberg, Shyu, & Liang, 1990) would be ill-advised considering that there is a larger chance for students to respond in order to feel socially acceptable. Vaccination has yet to be studied with peer influence as a factor in uptake. The topic of vaccination is dissimilar from other topics and hence, a scale specifically suited to vaccination is advisable.

Peer Communication and Sex

Peer communication has been the focus of health studies dealing with substance abuse and sexual behavior; however, due to parents primarily making all decisions regarding vaccination and children legally being wards of their parents, there is no literature regarding an adolescent’s decision to vaccinate. While there is no literature regarding adolescents’ vaccination decision making, research surrounding adolescent decision making is still relevant and applicable especially concerning the breadth of topics discussed.

First, adolescents discuss a wide amount of topics with their peers concerning their health. In Ritteneour and Booth-Butterfield’s (2006) study they polled college students on what sexual health related topics would they discuss with their peers: condoms (81.8%), birth control (72.7%), sexually transmitted diseases (55%), and AIDS (31.2%). It is important to note that this study examines what a student would discuss with peers, not what they had discussed with their peers. Obviously, teens are talking about sex. Additionally, it is important to acknowledge that
family may influence the impact of peer communication. An adolescent whose family has low
conversation orientation, may seek information more readily from peers if their family does not
discuss sensitive issues.

While adolescents may be discussing a broad range of health behaviors with their peers,
the messages may not always be accurate. Rouner and Lindsey (2006) found that the link
between perceived knowledge of adolescent female understandings of sexually transmitted
diseases and their actual knowledge was weak. The young women primarily relied on
information from their friends about sexually transmitted diseases and many simply relied on the
internet and encyclopedias for all their sexual health information. This lack of understanding
and reliance on potentially unreliable sources could lead to teens making irresponsible decisions
about their sexual health.

Research Proposal

With this understanding of the literature, the following hypothesis and research questions
can be proposed. Considering that peer influence is an important consideration when analyzing
adolescent’s decision making the following hypothesis is rational.

**H1**: If an individual has high peer influence to vaccinate against HPV and their friends believe
vaccination is important, the student will be likely to vaccinate.

While peer influence is an important consideration, family influence is also considerable,
especially when family and adolescent share the same opinion or intention.

**H2**: If a student has high familial influence to vaccinate against HPV and their family believes
vaccination is important, the student will be likely to vaccinate.
There are also other considerations when determining if communication will take place as well as how they view HPV. Increased knowledge is known to correlate with increased willingness to engage in a positive health behavior (Weber, 2006).

H4: The more knowledge a person has about the HPV, the more likely they will have positive attitudes about HPV vaccination.

While research does not exist that links particular family communication styles to specific topics of conversation, this information could be beneficial in determining if there are links between family styles to topics discussed.

RQ1: What type of family style is most likely to be related to an individual’s intent to vaccinate against HPV?

RQ2: When conflict between an individual’s beliefs and his/her family style is present, is the individual more or less likely to vaccinate against HPV?

Additionally, a better understanding of HPV vaccination can be gained if particular influences are addressed and better understood. RQ3 and RQ4 address the role of conversation as a determinant of HPV vaccination

RQ3: Does conversation with peers about HPV equate to an expressed intention of HPV vaccination?

RQ4: Does conversation with family about HPV equate to an expressed intention of HPV vaccination?

Considering adolescent decision making about HPV vaccination is previously unstudied in current literature, information surrounding whether family or peers are more influential could potentially influence how current health campaigns regarding adolescent HPV vaccination uptake are designed.
RQ5: Are peers or family more influential in decision-making about HPV vaccination?

Finally, it is important to consider in what types of contexts peers and family are most influential. These contexts can include consumer purchases, advice taking in romantic or peer conflicts, or health contexts that do not include the HPV.

RQ6: In what decision making contexts are peers most influential?

RQ7: In what decision making contexts is family most influential?
METHODOLOGY

Participants

The sample for this study was recruited from several large undergraduate mass communication classes. Although no extra-credit was provided, students fulfilled a portion of a required assignment through completion of this survey. The online questionnaire was available to students outside of their regularly scheduled class period online. Students ranged in age from 18 to 23. 13.7% (n= 27) of students were African-American, 80.7% (n= 163) were white, 1% (n= 2) identified as Latino, 1.5% (n= 3) as biracial, and 2% (n= 4) described themselves as “other.”

Procedures

Participants were recruited from large lecture halls classes. The researcher visited these classes and gave a brief explanation of the project. Students were given the link for the online survey which they had available in their syllabus. They logged on to the website through their course website and began the survey. Once they began the survey the instructor of the class as notified through email and the student received course credit whether the survey was completed or remained unfinished.

Measures

Independent Variables

There are several independent variables for this study, including level of family influence, level of peer influence, perceptions of family’s beliefs about the importance of the
vaccine, family communication style, knowledge about the HPV, conflict between parent and student’s beliefs, and decision making regarding consumer, social and health decisions. These variables will be explained in conjunction with their research questions and hypothesis.

For hypotheses H2 and RQ 5 family influence was used as the IV. Family influence was broken into two dimension family influence regarding vaccination against HPV and second, family influence regarding other health considerations. Each dimension was tested through 5 survey items. The first measured family influence regarding vaccination against HPV and was measured using items such as “I would be more likely to get vaccinated against the HPV if one of my family members was vaccinated,” “In choosing whether or not to get vaccinated against HPV, I would consider my families opinions,” and “After I have made my mind up about HPV vaccination, I would go through with my choice even if my family disagreed.” Responses were on a 5-point Likert scale ranging from strongly agree to strongly disagree. Cronbach’s alpha for the 10 item scale was .823.

The second family influence scale was designed to assess perceived familial influence regarding other health considerations. This scale included statements such as, “In general, my family would think getting a yearly physical is important.” The responses were measured on a 5 point Likert scale with strongly agree and strongly disagree as anchors. Levels of peer influence were gauged using similarly worded statements with “peer” substituted for “family.” Responses were on a 5-point Likert scale ranging from strongly agree to strongly disagree. Cronbach’s alpha for this 5 item scale was .78.

Also for H2 perceived family beliefs were used as an independent variable. This scale was created to measure participant’s perceptions of their family’s view of vaccination. Statements included, “When I was growing up, my parents stressed the importance of making
sure my vaccinations were up-to-date” and “I remember my parents discussing vaccinations as an important part of my overall health.” Responses were on a 5-point Likert scale ranging from strongly agree to strongly disagree. Cronbach’s alpha for this 3 item scale was .860.

For RQ3, conversation with peers was measured. For RQ4, family conversation was tested. Conversation with peers and family were measured simply with one questions each. Participants were asked to choose the option that represented their conversation most accurately. Choices ranged from “I have never discussed the HPV with any of my friends” to “I regularly discuss the HPV with at least one of my friends.”

For research questions 1 and 4, family communication style was used as an independent variable. Family communication style was tested through the Revised Family Communication Patterns instrument (Koerner and Fitzpatrick, 1990). Participants were asked to choose as many of the 18 statements that were representative of how their families communicated. Their family communication style was tested through the participant marking that the statement did apply to their family or signaling that the statement did not apply to their family by leaving the blank next to the statement empty. Statement included “My parents feel that it is important that they are the boss,” “In our family, we often discuss our feelings together,” and “I can tell my parents almost anything.”

For hypotheses 3, previous knowledge of the HPV was measured. Knowledge of the HPV was tested by five multiple choice questions including “The HPV is the only known cause of ____ cancer in women” where cervical, ovarian, breast, anal, and lymphatic cancers are the option. These questions are particularly useful in determining if people who do not intend to vaccinate are simply uninformed and with proper factual knowledge more people would be willing to vaccinate. Cronbach’s alpha for this 5 item scale is .61.
For RQ 2, participants were also asked to respond to the statement “My family and I have the same views about HPV vaccination” which was used to determine conflict between family and participants views of the HPV.

In RQ 6 and 7, decision making was the item being measured. The final independent variable is decision making regarding consumer, social, and health related decision making. This variable is tested in order to determine if the participant’s decision making regarding the HPV is different than in other decision making contexts. This was tested through 10 items including “If you were to purchase a new car, how much influence would your peers have in your decision making about which kind?,” If you had just had a first date with a new romantic interest, how much influence would your peers have in your decision making whether you will see the date again?,” and “If you had flu-like symptoms, how much influence would your peers have in whether you decide to go to the doctor?.” Responses were on a 5-point Likert scale ranging from strongly agree to strongly disagree. Cronbach’s alpha for the 10 item peer scale was .82. Cronbach’s alpha for the 10 item family scale was .86.

Dependent Variables

Six dependent variables were used for this study: intent to be vaccinated, amount of conversation with parents, attitudes about HPV, general decision making, peer influence and family influence.

First, for H1, H2, RQ2, RQ3, and RQ4, intent to vaccinate was measured. Intent to be vaccinated was tested by one item “I am vaccinated against HPV or intend to get vaccinated against HPV.” Responses were on a 5-point Likert scale ranging from strongly agrees to strongly disagree. Cronbach’s alpha for this 2 item scale was .781.
For RQ3, the amount of conversation with parents was gauged through one question. This variable is previously operationalized in the independent variables section.

For HQ3, attitudes about HPV were measured. These attitudes were studied through 7 items. Items included “I believe that those who contract the HPV are sexually promiscuous,” “People who contract the HPV get what they deserve,” and “If you get the HPV vaccine you are concerned about your sexual partners health.” Responses were on a 5-point Likert scale ranging from strongly agrees to strongly disagree. Cronbach’s alpha for this scale was .641.

Decision making was tested both concerning family and peer influence. Both decision making regarding non-HPV related items of peer and families were tested by using a scale with ten items each. Decision making was previously used as an independent variable for RQ 6 and RQ 7. Decision making’s operationalization is discussed in that section.

For RQ6 and 7, peer influence and family influence were tested as dependent variables.

For H2 and RQ5, family influence was examined as an independent variable. Family influence’s operationalization is explained in that section. Peer influence was measured through such statements as “I would be more likely to get vaccinated against the HPV if one of my family members was vaccinated,” “In choosing whether or not to get vaccinated against HPV, I would consider my families opinions,” and “After I have made my mind up about HPV vaccination, I would go through with my choice even if my family disagreed.” Responses were on a 5-point Likert scale ranging from strongly agrees to strongly disagree. Cronbach’s alpha for the 6-item peer scale was .79. Cronbach’s alpha for the 6-item peer scale was .75.
RESULTS

A total of 202 participants were recruited from the College of Communication Research Participation Pool after IRB approval was received. Participants ranged in age from 18 years to 23 years (n= 202), with a breakdown of 29.7% male (n= 60) and 70.3% female (n= 142). Eighty percent of participants classified themselves as white (n= 163), 13.4% as African American (n= 27), with less than 4 or less participants classifying themselves as Latino, Asian, biracial, or other. Sixteen percent (n= 33) felt they were very informed about the human papillomavirus, 59.9% felt that they were somewhat informed about the human papillomavirus, while 23.8 (n= 48) felt that they were not at all informed about the human papillomavirus. Additionally, 21.2% (n= 43) of the participants considered themselves liberal or very liberal, 33.7% (n= 68) consider themselves politically moderate, and 45% (n= 91) consider themselves either politically conservative or very conservative. Finally, 44.6% (n= 90) of the participants had already received the HPV vaccine, 29.2% (n= 59) were not vaccinated but intended to receive the HPV vaccine, while 26.2 (n= 53) were not vaccinated and did not intend to become vaccinated. Independent t-tests were run to determine if statistically significant difference were found between gender and intent to vaccinate. No significant differences were found.

Findings

Hypothesis 1 examined the relationship between an individual’s level of peer influence and the individual’s likelihood to vaccinate against HPV. Higher degrees of peer influence were expected to predict a great intent to vaccinate due to perceived time spent with peers as well as the potential high influence a peer might have in other areas of decision making. A simple linear
regression was conducted between the two independent variables, level of peer influence and perceived peer views of HPV vaccination, as well as the dependent variable of intention to be vaccinated against HPV. There was no significant relationship between the variables, and thus the hypothesis was not supported. This result could be explained through the possibility of outside factors including issues of cost or access. Additionally, it is possible that college students are more influenced by their family members which the student may have a past history of gaining health information. This lack of support could be explained in several ways including many possible outside factors and variables that were not measured. For example, an individual’s expressed intent to vaccinate could be low simply because of cost of vaccination is high or accessibility to receive the vaccination could be perceived as being challenging. It is also possible that for students in this sample, influence when it comes to making specific decisions regarding health may come more from parents instead of peers simply because the participants are more think likely to have come from home situations where parents make most of the decisions regarding health. Given the age of the sample, it seems plausible that in terms of outside sources influencing the individual with regard to health issues, participants may be more inclined to be influenced by a family member or by no one at all. Other possible reasons for the lack of support will be addressed in post hoc analysis.

Hypothesis two examined the relationship between an individual’s level of family and influence and the individual’s likelihood to vaccinate against HPV. Higher levels of family influence were expected to predict a great intent to vaccinate due to perceived influence by family on other decision-making situations. To test hypothesis two, a simple linear regression was run. When family influence was examined with the dependent variable, no relationship interaction was found; however, but when the two variables were examined together a significant
negative relationship was found ($\beta = -.031$, $t(-4.135)$, $p<.01$). Simply put, the more family influence a person has to vaccinate, the less likely he/she is to vaccinate against HPV. This can potentially be understood through a lack of discussion between parents and college students about HPV vaccination as well as the possibility of personality variables which may include the lack of being able to be swayed by any outside force. Additional discussion will be addressed in research question seven. After examining both peer and family influence on HPV vaccination, it appears that a person’s subjective norms are not influential in this particular health behavior or are not reported to be influential.

Table 1: Summary of Multiple Regression Examining Family Views on Vaccination and Influence of Family on Intent to Vaccinate

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>$F$</th>
<th>df</th>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Influence</td>
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<td>.00</td>
<td>.52</td>
<td>196</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family View of Vaccination</td>
<td>-.31*</td>
<td>.08</td>
<td>-4.13</td>
<td>196</td>
</tr>
</tbody>
</table>

Hypothesis 3 examined the relationship between knowledge and attitudes about HPV vaccination. More positive attitudes were expected from participants who had knowledge about HPV vaccination. Pearson’s correlation coefficient was run to determine the relationship between knowledge and intent to vaccinate. No relationship between the variables was found. This result may be explained by knowledge not necessarily equaling acceptance. A student may exhibit a considerable amount of knowledge about HPV and HPV vaccination, but knowledge alone may not translate into positive attitudes. Even though cost and access appear to be obvious factors not measured but important in terms of attitudinal influence, it is also possible that given the
nature of the topic itself, participants in this study were hesitant to express a positive attitude about the vaccination because it could insinuate something about their sexual behavior. Even though this link may not be logical, it may be one factor of importance in the understanding of the findings reported here. Additionally, there could also be outside variables that would influence the importance of knowledge such as cost and access.

Research question one examined what the type of family style that would be most likely to be related to an individual’s intent to vaccinate against HPV. A one way analysis of variance tests was run to see if there was a difference between family styles and an individual’s intent to vaccinate. Results were not significant. An examination of the descriptive statistics indicated that families with a protective style of communication were most likely to vaccinate. Pluralistic families scored higher on concept-orientation but low on socio-orientation. Children are allowed to disagree, communication was open, and the breadth of topics is wide. What this means is that in families where conversation is open HPV vaccination was more likely. This is not surprising because in this type of family those who wish to vaccinate, even when conflict exists between family members, can do so without ramifications. Individuals from consensual families were least likely to vaccinate. Consensual families score high on both concept-orientation and socio-orientation. Discussion is promoted in this type of family but in the end it is important that a singular decision is made.
Research question 2 sought to explain when the effects of conflict between individual’s beliefs and his/her family style and its impact on HPV vaccination. A Pearson correlation coefficient was run examining the relationship of conflict and intention to vaccinate. The correlation was negative indicating that as conflict increased likelihood to vaccinate decreased. For further interpretation, an ANOVA was run. Looking at 5 different response answers, those who chose strongly disagree, which equals greatest conflict between family and an individual’s beliefs (n= 53), expressed least intent to vaccinate. When examining the relationship between conflict between individual’s beliefs and his/her peers and its impact on HPV vaccination, the results were the same: more conflict leads to less intention to vaccinate.

Research question 3 examined the relationship between conversation with peers about HPV and expression of intention to vaccinate against HPV. A Pearson correlation coefficient was conducted between independent variable conversation and the dependent variable, intention to vaccinate against HPV. A significant, negative relationship was found between conversation with peers with intention to vaccinate (-.23, p<.001). The more conversation that took place, the less likely it would be for an individual to vaccinate. It is possible that the individuals have made up their minds about HPV vaccination and no matter the amount of conversation about HPV; the
individual will not change their opinion. Many individuals will not be swayed by amount of conversation.

Research question 4 examined the relationship between conversation with family about HPV and expression of intention to vaccinate against HPV. Again, like research question 3, there was a significant, negative relationship (-.23, p<.001) between conversation and intention to vaccinate against HPV. An additional consideration for these findings includes college students talking to people who are not peers or family members about HPV vaccination. People such as doctors may be highly influential in determining HPV vaccination or simple media exposure to advertisements and news coverage.

Research question 5 sought to determine whether peers or family were more influential in decision-making about HPV vaccination. In order to determine which group was more influential in decision making regarding HPV vaccination, a subtractive scale was created whereby the peer views of HPV scale was subtracted from the family views of HPV scale. Thus, if the perceived peer and family views regarding HPV vaccination were the same, a score of 0 would be found. If a negative value was found, it was indicative of peer views on HPV being more influential than family views. If a positive score was found, it was indicative of family views regarding HPV being more influence on the participant than peer views. Thus, this subtractive scale allowed the researcher to assess how or if peer or family views on HPV were more influential in decision making regarding HPV. Based on the subtractive scale, 76 percent of participants felt that family and peers were equally influential in regards to HPV vaccination. Fifteen percent felt peers were more influential and 8 percent felt that family members were more influential than peers in regards to HPV vaccination.
Research question 6 sought to explain in which decision-making contexts peers were most influential in consumer situations, interpersonal situation, and general health situations. Descriptive statistics were used to determine in which context in which peers were most influential. The scale ranged from a low of 4 and high of 20. By dividing the mean by the range of 16, peers were most influential in matters of consumer decision making (.81), then interpersonal situations (.79) and finally least influential in health decision making (.66).

Research question 7 sought to explain in which decision-making contexts family were most influential. The scale ranged low of 4 and high of 19. By dividing the mean by the range of 15, family was most influential in interpersonal situations (.74), then in consumer situations (.69) and finally in health situations (.66). Overall, peers are more influential than family in family and consumer situations. In health situations, peers and family members exert the same amount of influence (.69).

Post Hoc Analysis

Given the outcomes of previous research, one would expect to find a positive likelihood to vaccinate. However, most variables when combined with intent to vaccinate expressed negative relationships in this study.

Table 3. Correlations between Individual Factors Influencing HPV Vaccination

<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>
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<td>1. Intent</td>
<td>-.68</td>
<td>-.21*</td>
<td>-.06</td>
<td>-.32**</td>
<td>.06</td>
<td>-.01</td>
<td>-.23*</td>
<td>-.23*</td>
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<tr>
<td>2. Knowledge</td>
<td>.03</td>
<td>-.01</td>
<td>.08</td>
<td>-.02</td>
<td>.10</td>
<td>.08</td>
<td>.04</td>
<td></td>
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</tr>
<tr>
<td>3. Attitude</td>
<td>.29**</td>
<td>.19*</td>
<td>-.09**</td>
<td>.14</td>
<td>-.02</td>
<td>.07</td>
<td></td>
<td></td>
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<tr>
<td>4. Peer Influence Regarding HPV</td>
<td>.51</td>
<td>-.20</td>
<td>.26</td>
<td>.04</td>
<td>.05</td>
<td></td>
<td></td>
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<tr>
<td>5. Family Influence Regarding HPV</td>
<td>-.34**</td>
<td>.15*</td>
<td>.11</td>
<td>.18**</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Family Influence General</td>
<td>.48**</td>
<td>-.12*</td>
<td>-.22*</td>
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<tr>
<td>7. Peer Influence General</td>
<td>.04</td>
<td>.10</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Conversation with Peers</td>
<td></td>
<td></td>
<td></td>
<td>.72**</td>
<td></td>
<td></td>
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<tr>
<td>9. Conversation with Family</td>
<td></td>
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</tbody>
</table>

Note.  *p< .05  **p<.01
When examined individually most variables were not positively correlated with intent to vaccinate. However when examined in combination through regression, they proved to be statistically significant when combined with intent to vaccinate. In sum, attitudes about vaccination and peer influence related to vaccination were the strongest predictors of intent to vaccinate, but both were still negative predictors. Reasons for the negative relationship will be discussed in the next chapter.

Table 4. Post-hoc Regression Analysis Examining Knowledge, Attitudes, Peer and Family Influence and Conversation on Intent to Vaccinate

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>β</th>
<th>R²</th>
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<th>df</th>
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<tr>
<td>Step 1</td>
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<tr>
<td>Knowledge</td>
<td>-.07***</td>
<td>.01</td>
<td>-.93</td>
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<tr>
<td>Attitude</td>
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<tr>
<td>Peer Influence to Vaccinate</td>
<td>-.38*</td>
<td>.16</td>
<td>-4.82</td>
<td>188</td>
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<tr>
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<td>Step 4</td>
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<td>General Peer Influence</td>
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<td>.08</td>
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<tr>
<td>Conversation with Family</td>
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*p< .001, **p<.01, ***p<.1
DISCUSSION

The goal of this study was to better understand the influence of family and peers on HPV vaccination, illuminating specific influences of knowledge, family style, conflict as well as conversation. This study is one of the first in the field of communication addressing communication and vaccination uptake. Considering that much of people’s understanding about health and health practices comes from both personal experiences and personal experiences of others, this deficit is notable. The theory of reasoned action was used to guide this study. It proved helpful in examining the relationship between societal norms, attitudes, and intention to vaccinate. It was predicted that peer influence, family influence and increased knowledge would be positive predictors of HPV vaccination. However, none of the variables proved to influence HPV vaccination. Additionally, family style, conflict between family members, conversation as well as determining in what areas family and peers were most influential was addressed. It was found that family style was not a significant variable when determining HPV vaccination. A surprising finding was that individuals who had little conversation with their peers and families about HPV vaccination were most likely to vaccinate. Finally, the study examined in which areas peers and families were most likely to be influential in the individual’s decision making process. In rank order, individuals were most likely to be influenced in consumer situations, interpersonally, and last in health situations by their peers and family. These results demonstrate that health issues may still be considered private areas where input from others may be unwanted or unheeded.
Previous understanding of vaccination and vaccination uptake has been focused on parental decision-making whose own vaccination records were decided by their parents. HPV vaccination is one of the first vaccines where individuals who are considered legally adults are making their own decisions regarding vaccination against a disease that has moral considerations instead of simple health considerations. For example, receiving a flu shot or a tetanus booster have no moral consideration, but due to HPV being contracted through sexual activity, many feel that are moral implications to receiving the vaccination. These moral concerns are highlighted considering that girls as young as 6 years old are recommended to receive the vaccine. Give the recency of the vaccination’s creation and given that public service announcements and promotional material for the vaccination have only been created and distributed since 2006, it is possible that parents of participants in this sampler were hesitant or unlikely to think of acquiring the vaccine for their daughters because by doing so, the implication could be construed as acceptance of sexual activity. Parents of younger children may be less inclined to feel this way because the likelihood of their children being sexually active is lower. Obviously there is controversy surrounding HPV vaccination and this study is one of the first to bring to light many of the communicative variables in understanding its uptake.

This analysis of HPV vaccination indicated that peer and family communication may be less influential than other variables concerning vaccination uptake. Overall, this study found that once a person made a decision regarding vaccination he/she are not influenced by peers and family factors. This chapter will further discuss the variables of knowledge, conversation levels, intention, limitations, and finally directions for future research.

Before individual variables are discussed, it is important to first look towards a finding that may have influenced all variables. Participants were asked questions regarding how much
influence their peers and family would have in certain situations. It was found that, in order, peers and family had the most influence first, in consumer situations, second, in interpersonal relationships, and finally when they are trying to make health related decisions. This finding is important due to how closely the findings link to HPV vaccination. For example, due to the cost of HPV vaccination, three shots at 120 dollars apiece, parents could potentially impact a student’s decision to vaccinate greatly. For example, if a student wished to vaccinate against HPV and their family disagreed, the family could potentially withhold the 360 dollars making it impossible for the student to vaccinate. Additionally, it is important to note that both family and peers were reported to have little impact on a student’s health decision making process. This finding could explain the findings regarding high peer and family influence to vaccinate with the participant still claiming no intent to vaccinate.

There is one final consideration that needs to be addressed before individual variables can be discussed; some people are not swayed by their family or peers no matter the situation. Some participants were not influenced by any of the outside factors addressed in the study. It is possible that some people have personalities where they make their own decisions without the influence of others and do not seek others’ input. Because these individuals claim no influence all of the variables could be affected by such a variable. It is also possible that some of the participants in this sample are not easily or quickly swayed by the influence of others and therefore make decisions on their own as it relates to all kinds of issues such as consumer purchasing, interpersonal interactions, or health decision-making.

Knowledge

This study found that increased knowledge did not equate to an increased desire to vaccinate, which was surprising considering that other research is found that increased
knowledge often leads to an individual engaging in positive health behaviors. Although this finding is important, it is also important to acknowledge that few participants were knowledgeable about the human papillomavirus. This lack of knowledge about the human papillomavirus could have significantly influenced many of the other variables such as intention. It would be logical for a person to express no intent to vaccinate if they knew little about vaccination. However, those with the least amount of knowledge were most likely to vaccinate against the human papillomavirus. This response can be explained by looking at the sample. Few participants proved that they held knowledge about the human papillomavirus and its transmission. This lack of knowledge could be explained by confounding factors such as having parents who strongly approved or disapproved about the human papillomavirus or having a preexisting attitude about the HPV vaccination that was not influenced by a person’s knowledge. There is another possible consideration for expressing intention to vaccinate without knowledge. A person may express intention to vaccinate without knowledge about HPV vaccination, simply because it was posed to them and they may express intention to do other health-related behaviors for the same reason. For example, if a person has no knowledge about HPV vaccination they have no idea of the side effects, cost, their need of receiving the vaccination or other considerations so there would be no drawbacks to receiving the vaccination. The actual word “vaccination” appears to be something that is useful or good in terms of overall health, so if an individual is asked about receiving vaccination for something he or she knows little about, it is possible that individual may express intention to vaccinate simply because it seems like the appropriate response.
Conversation

Conversation was found not to be influential when considering intent to vaccinate against HPV. Considering that people tend to engage in romantic and friendship relationships with others who share common values and beliefs, it is possible that conversation was merely reinforcing an individual’s previous beliefs about the human papillomavirus. It is also possible that a person may not be seeking affirmation of their decision making about the human papillomavirus or seeking information from another person, but are instead bringing up their beliefs about the vaccination.

There are also considerations due to the geographic area that the sample was drawn from. The sample was drawn from an area that is politically conservative as well as religious area. There may be social ramifications by discussing sex or sexually transmitted disease. Individuals may feel that if they discuss HPV or HPV vaccination their peers or family may think that they are sexually promiscuous or already have contracted HPV.

Family Communication Style

Protective families were most involved with a college student’s health related decision making. Protective family types are characterized by few conversational topics as well as the need for conformity between family members. It is logical that this type of family would be most active in a college-student’s life since the student will have few options for discussing new topics such as HPV vaccination as well as the knowledge that there is a need for conformity which may mean ignoring their own feeling about HPV vaccination.

Additionally, family style was discussed in relation to HPV vaccination. There was no correlation between family style and intent to vaccinate. No family style was more or less likely to be related to an individual’s intent to vaccinate or not. The explanation for this can be looked
at in different ways. First, more or less conversation is not affiliated with intention to vaccinate. Just because a family has high conversation does not mean they are discussing the human papillomavirus or possessing a positive or negative view of the human papillomavirus vaccination. Second, the need for conformity within the family is not related to intent to vaccinate. This result can be explained by the kind of information shared with family as the adolescent ages. Although many young teenagers feel comfortable sharing many kinds of information with their family, older teenagers and young adults may begin withholding certain kinds of information such as sexual activity which may convince a person that they need the vaccination. There can be no conformity if two parties do not share information.

**Intention**

The study was also influenced by the amount of people who expressed intention to vaccinate. It is also important to acknowledge that individuals who took the survey could have ignored or not fully read the information sheet provided about the human papillomavirus. Currently the vaccination is not available for men in the United States. The information sheet, taken from the Centers for Disease Control website, stated that the vaccination may soon be available for men. Male readers could have not read this information and chose the response that insinuated that they were not vaccinated nor intended to vaccinate, even though they would have chosen to vaccinate if they believed it was available for them. Currently there is no campaign directed towards men even though penile and anal cancers are linked to the HPV. The way media treats the human papillomavirus may be following the same path it took with breast cancer. There are no media campaigns teaching men how to examine themselves for breast cancer, no races for the cure that include male breast cancer survivors, and many people are shocked that men can even have breast cancer. Unfortunately, the human papillomavirus is
currently portrayed with women in the commercials and little discussion of consequences of acquisition in men. This could set a framework where HPV is a woman’s disease.

Additionally, it is important to acknowledge that while Ajzen and Fishbein (1980) consider intention the best predictor of behavior, intention is not always enacted. Just because an individual expressed interest in vaccination does not mean that he/she will necessarily become vaccinated. There are numerous barriers to HPV vaccination that were not focused on in this study including health insurance coverage, cost, access, as well as a variety of other factors.

Overarching Considerations

This study proves valuable in understanding how the HPV virus is viewed by college students; however, it is important to address considerations based solely on the topic studied. Studying HPV vaccination is difficult considering an individual’s potential reluctance to answer truthfully as well as a potential lack of thought before the study. First, when discussing a sexually transmitted diseases or sexual behavior, there is a possibility for the participants to not want to respond truthfully fearing judgment or feeling uncomfortable about the topic. Nearly 72 percent of the sample was either 18 or 19 years old which means that means they are probably in their first or second year of college. Many college students are making their own health decisions for the first time in their lives and with inexperience may come inaction. It is known that many adolescents feel that negative health outcomes will not happen to them such as drunk driving or pregnancy. Especially with this age group it is possible that they may feel that contracting the HPV is something that happens to others and may feel that they are invincible.

Second, the study showed that participants lacked knowledge about the human papillomavirus which could insinuate that the study may have been influenced by participant’s first learning about the virus from the study’s informational material. This would not be a
consideration if the study was focusing on a disease such as breast cancer or AIDS where these particular ailments receive more media coverage than HPV. This lack of knowledge could have influenced every component of this study.

It is also important to consider what implications this study creates for the theory of reasoned action. The basic foundation of the theory, attitudes plus subjective norms would equal intention, was not supported. The study found that, overall, people have positive attitudes about HPV vaccination, but people were not being impacted by their subjective norms. Even though each individual weighs attitudes about a given topic and subjective norms differently, influence of subjective norms were still found to be negatively related to intention to vaccinate. Thus this study did not support the theory of reasoned action. It is possible that other variables could prove to be more relevant to this study. Additionally, the theory of reasoned action has a basic premise that humans are rational beings, however, when it comes to health behaviors that may have moral considerations it may not be completely appropriate. No person wants cervical, rectal, or penile cancers which would mean that everyone would support HPV vaccination which is not accurate. Potentially issues such as a person’s personality or willingness to change their behaviors should be studied and applied to the theory of reasoned action. Issues such as perceived susceptibility may prove more influential in studying HPV vaccination uptake as opposed to subjective norms. The study did not support the theory of reasoned action. However, it does the lay the foundation for the use and application of other theoretical frameworks that examine factors on an individual level. Psychological theories would especially be helpful to explain an individual’s expressed intent to vaccine, to further understand the attitudes and beliefs and individual has regarding HPV vaccination as well as determining what personality factors prohibit a person from being influenced by their subjective norms.
Finally, implications can be drawn for the field of health communication from this study. In the field of health communication studies are often conducted focusing on a disease or ailment that primarily affects one sex such as prostate cancer or breast cancer. This study has shown that although HPV’s effects are primarily female, men are aware and, in this situation, more knowledgeable and willing to take preventative measures to avoid contracting the virus as well as transmitting it. Scholars in the field of health communication should address this unexpected outcome by including data about those that may not be the primary focus of the study.

Additionally, although specific family styles proved insignificant in influencing intention to vaccinate, family communication styles may prove more important in discussions about health communication topics that people in which people are more informed. Lack of knowledge, which may have stemmed from lack of exposure, may have influenced the lack of intention to vaccinate. But the need for family to conform to one opinion or the ability for the family to discuss varied topics may be important variables in other health related situations. For example, if families discuss the importance of yearly dental examinations and the need for conformity within the family is high, an individual may continue yearly dental examinations years after living outside the immediate family.

Limitations

This study has several important limitations that may affect the interpretation of results. First, because participants all were drawn from the same university in the deep south, the study sample was relatively homogeneous, and similar results may not be seen in other populations. This study was overwhelmingly white, politically conservative, college aged, and female. Each of these characteristics uniquely affects the outcomes of this study. Over 80 percent of the participants were white. Although race has not been specifically analyzed in relation to HPV
vaccination, different racial groups may be affected differently in relation to cultural expectations as well as physiological differences. With an individual’s racial identity comes a host of factors which need to be addressed in relation to HPV vaccination.

Second, political ideals could influence the application of this data on other groups. More than 45 percent of the participants considered themselves politically conservative or very conservative. Politically conservative groups were the first to speak out against the vaccine for religious reasons including the lack of need for the vaccine if people only had one sexual partner and were monogamous. A politically liberal group could be more likely to be more accepting of the vaccination. Additionally, this group was entirely between the ages of 18-23. This group had some college education which is not representative of the United States population.

There are considerations that must be acknowledged given that 70 percent of the population was female. This imbalance does not lend itself to application to other population groups. Considering that the vaccination is currently only available for women, it is possible that women could feel more informed than men or feel that the human papillomavirus was particularly relevant.

Finally, the issue of socioeconomic status must be addressed. All of the participants were enrolled in college which is associated with increased socioeconomic status. Increased education may be linked to more access to health care as well as willingness to engage in preventative health measures. If this study were conducted with a more diverse socioeconomic population the results may have been different.

Beyond demographics there are additional considerations. Individuals who completed this study may have had higher interest in the human papillomavirus than the average population. Additionally, this study examined the influence of only a subset of variables that determine
attitudes about HPV as well as intention to vaccinate. It is likely that there are additional variables that also inform individuals about HPV vaccination. For example, cost of the vaccination, insurance coverage, as well as access are all relevant variables that should be addressed in future research. Further, the survey did not ask the individual about their sexual partners. Individuals who were not sexually active or who were in a monogamous relationship may have felt that the vaccination was not necessary.

*Future Research*

With this understanding of the human papillomavirus, it becomes even more apparent that research needs to be focused on the role of communication on HPV vaccination. The implications for both Merck and those creating and packaging information for consumers is especially important. First, Merck may want to rethink their current advertisements which solely focus on women and the impact of the virus on a woman’s body. In the study, it is obvious that men are aware of the virus and are interested in vaccination. Although the virus is not currently available for men in the United States, many believe that the vaccination will be available for men in the near future. Advertisers could begin to focus on a man’s role in preventing HPV as well as beginning to advertise in magazines that have large proportions of male readers. Currently much responsibility lies on the female partner in a sexual relationship. Birth control pills are taken by women. Women deal with the physical consequences of pregnancy. Women often deal with childcare responsibilities. Getting the HPV vaccine could be seen as just another chore that may or may not get done. Now the human papillomavirus vaccine is continuing to place both the financial burden as well as responsibility on sexually active women. Merck is continuing to frame sexual and reproductive health issues on women with no responsibility on men. However, most men expressed interest in HPV vaccination which may
mean that men were willing to take on this sexual health responsibility. By reframing the virus as one that both men and women should be aware of, the potential for herd immunity increases especially since men are aware of and interested in HPV vaccination. This awareness and interest could also be heightened through Merck addressing the potential physical implications of HPV on men. Although the rates of penile and rectal cancers rates among men are considerably lower than cervical cancer rates in women, few men are aware of the physical ramifications for men. Future studies need to address what types of frames are most beneficial for men or women concerning HPV vaccination. Considering that positive frames are not fully reaching women proven by low intention to vaccinate but are reaching men proven by the higher intent to vaccinate, the valance of framing may be a key component to understanding HPV vaccination uptake and sex. Additionally, future research should also determine what exactly about HPV and HPV vaccination makes it appealing to men. Once these factors are determined they should be tested with other sexual health issues such as condom use and prevention tactics for other sexually transmitted diseases.

Additionally, the Merck “I Want to be One Less” commercials and advertisements solely portray women who are teenagers or young adults even though the target age for receiving the vaccination is before sexual activity. Teenagers and young adults will be more likely to engage in sexual activities than young girls who are 7 or 8. Considering that this study found that college age students are not swayed by their family and friends who may influence health related decision-making, using images of young girls may influence parents who think positively about HPV vaccination to vaccinate their young daughters when they have control of their vaccinations.
Second, while many are aware of HPV, knowledge about HPV vaccination is low. Physicians as well as health educators need to be aware of this deficit and begin to tailor their messages to address this need. Knowledge was tested through questions involving transmission as well as effects of the virus. Considering that HVP can be transmitted by skin to skin contact as opposed to fluid transfer like most other sexually transmitted diseases, knowledge is especially important in order to avoid transfer. Further study needs to examine exactly that types of knowledge college students have about HPV and begin to address ways to tailor public service announcements as well as other information dissemination to address this need.

Third, further research should begin to address the role of peers and vaccination. Family influence and communication has begun to be addressed, peer influence and communication has barely been addressed. This is especially important due to HPV vaccination often being administered to college and university students and this group is in contact with their peers almost constantly. Preteens and high school students mainly see their peers during school hours. College students who live in dorms are constantly surrounded by their peers potentially heightening their influence. College students may be making more of their decisions which also could heighten the influence of peers. Further, many people do seek health related information from their peers. For example, if someone is seeking a new doctor, trying to find the type of cold medicine that is the most effective, or asking the symptoms of food poisoning, information may be sought from their peers.

Fourth, this study found that few variables positively influence intention to vaccinate. Currently media coverage outside of news articles is limited to television and magazine advertisements. Clearly this is not working to increase vaccination uptake. Because having sex is a moral consideration and vaccination, in general, is a health consideration, HPV vaccination
is especially complicated. Thus future research needs to address the effectiveness of a multi-channel campaign. If HPV vaccination were discussed as often and without shame as doing a breast self-examination or preventing urinary tract infections, it is possible that knowledge would increase to where people could make informed decisions about vaccination instead of making a judgment based on a single commercial or newspaper article. Many respondents in the study were unaware of how HPV is spread or even if it required sexual contact. Future research needs to examine the combination of campaigns to determine effectiveness.

Additionally future research needs to address influences outside the realm of communication. This study is a starting point in better understanding intention to vaccinate against HPV; however, variables such as cost and access were not addressed. If a person does not have the estimated 360 dollars to receive the three shots or the ability to drive themselves to a doctor’s office to receive the vaccine, the concerns could be more influential that communication issues. These very real concerns should be addressed in further studies.

Finally, it is important to address that the field of medicine is constantly changing and hence, people’s opinions of health procedures and health are also changing. Since HPV has only been in the media spotlight since the advent of Gardasil in 2006, information about HPV and Gardasil is constantly changing. Because public opinion and information about HPV and HPV vaccination is unstable, replication of this study need to address the time period in which the study was completed.

Although the results to this study were surprising, this study provides a foundation for future research to begin to better understand HPV vaccination. Most importantly, this study found that peer and family communication are not key variables in understanding HPV vaccination uptake which lets future researchers examine other personality, economic and access
factors. By better understanding how HPV vaccination is viewed by college students, men’s interest in the vaccine, and how conversations influences uptake, it becomes clear that HPV vaccination is a complex decision for an individual that is influenced by attitudes as well as individual factors such as religiosity and political affiliation as well as willingness to be influenced. Knowing which factors are influential as well as which factors are not important can allow future researchers to understand this moral and health related decision making process.
References


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Appendix

Age: ______ years old

Sex:  1)_____ male  2)_____ female

Race:
1)_____ African American
2)_____ Caucasian
3)_____ Latino
4)_____ Asian
5)_____ Other

I feel
1) _____ Very informed about the human papillomavirus (HPV)
2) _____ Somewhat informed about the human papillomavirus (HPV)
3) _____ Not at all informed about the human papillomavirus (HPV)
1) _____ is the most common sexually transmitted disease in the United with 50 to 80 percent of the population having it at one point in their lives.
   a. Human papillomavirus (HPV)
   b. Herpes
   c. Chlamydia
   d. Gonorrhea
   e. AIDS

2) The human papillomavirus (HPV) is the only known cause of ___________ cancer in women.
   a. Cervical
   b. Ovarian
   c. Breast
   d. Anal
   e. Lymphatic

3) The only cure for the human papillomavirus (HPV) is/are ______________.
   a. There is no known cure
   b. The vaccine, “Gardasil”
   c. Antibiotics such as penicillin
   d. Surgery
   e. Bed rest

4) The physical symptoms of the human papillomavirus (HPV) in men are __________.
   a. No physical symptoms
   b. Potentially genital warts or no symptoms
   c. Always genital warts
   d. Flu like symptoms
   e. Men do not get HPV

5) The human papillomavirus (HPV) is spread through __________.
   a. Skin to skin contact
   b. Blood
   c. Sex
   d. Toilet seats
   e. All of the above

What is HPV?

Genital human papillomavirus (HPV) is the most common sexually transmitted infection (STI). Approximately 20 million Americans are currently infected with HPV, and another 6.2 million
people become newly infected each year. At least 50% of sexually active men and women acquire genital HPV infection at some point in their lives.

The virus infects the skin and mucous membranes. There are more than 40 HPV types that can infect the genital areas of men and women, including the skin of the penis, vulva (area outside the vagina), and anus, and the linings of the vagina, cervix, and rectum. You cannot see HPV. Most people who become infected with HPV do not even know they have it. Genital HPV is passed on through genital contact, most often during vaginal and anal sex. A person can have HPV even if years have passed since he or she had sex. Most infected persons do not realize they are infected or that they are passing the virus to a sex partner.

**What is the HPV vaccine?**

The vaccine, Gardasil, is the first vaccine developed to prevent cervical cancer, precancerous genital lesions, and genital warts due to HPV.

**Who should get the HPV vaccine?**

CDC recommends the HPV vaccine for all 11 and 12 year old girls. The recommendation allows for vaccination to begin at age nine. Vaccination also is recommended for females aged 13 through 26 years who have not been previously vaccinated or who have not completed the full series of shots.

**Is the HPV vaccine safe?**

The FDA has licensed the vaccine as safe and effective. This vaccine has been tested in thousands of females (9 to 26 years of age) around the world. These studies have shown no serious side effects. The most common side effect is brief soreness at the injection site. This vaccine targets HPV types that cause up to 70% of all cervical cancers and about 90% of genital warts. The vaccine will not treat existing HPV infections or their complications.

**What about vaccinating males?**

Studies are now being done to find out if the vaccine works to prevent HPV infection and disease in males. When more information is available, this vaccine may be licensed and recommended for boys/men as well.

Information taken from the Centers for Disease Control website, last accessed September 11, 2008
Family Communication Styles

Place a mark next to each statement that you agree with.

_____ In my family, we often talk about our plans and hopes for the future.
_____ We frequently talk as a family about the things we have done during the day.
_____ My parents tend to be very open about their emotions.
_____ I really enjoy talking with my parents, even when we disagree.
_____ My parents and I often have long, relaxed conversations about nothing in particular.
_____ In our family, we often discuss our feelings together.
_____ I can tell my parents almost anything.
_____ My parents often ask my opinion when the family is talking about something important.
_____ My parents frequently say things like “Every member of this family should have some say in decisions.
_____ When anything really important is involved, my parents expect me to obey without question.
_____ My parents feel that it is important that they are the boss.
_____ In our home, my parents usually have the last word.
_____ My parents sometimes become irritated when my views differ from theirs.
_____ If my parents don’t approve of a particular behavior, they don’t want to know about it.
_____ When I am at home, I am expected to obey my parents’ rules.
_____ My parents often say things like, “My ideas are right, and you shouldn’t question them.”
_____ My parents often say things like, “There are some things that just shouldn’t be talked about.”
_____ My parents often say things like, “You’ll know better when you’re older.”

1) I am vaccinated against HPV or intend to get vaccinated against HPV.

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2) I believe that the human papillomavirus vaccine should be available to those who wish to obtain it.

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3) I believe that those who contract the human papillomavirus (HPV) are sexually promiscuous.

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4) I believe that those who contract the human papillomavirus (HPV) deserve to contract the virus.

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5) The best way to avoid contracting the human papillomavirus (HPV) is to avoid sexual contact.

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6) People who contract the human papillomavirus (HPV) get what they deserve.

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7) If you get the human papillomavirus (HPV) vaccine you are concerned about your health.

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8) If you get the human papillomavirus (HPV) vaccine you are concerned about your sexual partners health.

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9) Being proactive by receiving the vaccine before having sex for the first time is a smart way to avoid contracting the human papillomavirus (HPV).

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10) I am not vaccinated and do not intend on getting vaccinated against HPV.

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11) Choose the letter that most corresponds with your actions.
   a. I have never discussed the human papillomavirus with any of my friends.
   b. I have discussed the human papillomavirus with at least one of my friends on one occasion.
   c. I have discussed the human papillomavirus with at least one friend on more than one occasion.
   d. I regularly discuss the human papillomavirus with at least one of my friends.
12. Choose the letter that more corresponds with your actions.
   a. I have never discussed the human papillomavirus with any of my family.
   b. I have discussed the human papillomavirus with at least one of my family members on one occasion.
   c. I have discussed the human papillomavirus with at least one family member on more than one occasion.
   d. I regularly discuss the human papillomavirus with at least one of my family members.

13. I would be more likely to get vaccinated against the human papillomavirus if one of my friends was vaccinated.

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14. I would ask my friends what they think about vaccinating against HPV if I was trying to decide whether to vaccinate.

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15. In choosing whether or not to get vaccinated against HPV, I would talk to my friends.

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16. In choosing whether or not to get vaccinated against HPV, I would consider my friends opinions.

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17. I am worried what my friends would think of me, if I got the human papillomavirus vaccine (HPV).

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18. After I have made my mind up about vaccination, I would go through with my choice even if my friends disagreed.

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19. In general, my friends would think getting a yearly physical is important.

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20. In general, my friends would think that getting a flu shot is important.

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21. In general, my friends would think that using condoms or other forms of birth control is important.

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22. In general, my friends would think that going to the dentist yearly is important.

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23. In general, my friends would think that taking vitamins is important.

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24. Scientists should create a vaccine that would eliminate Leukemia.

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25. Scientists should create a vaccine that would eliminate erectile dysfunction.

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26. Scientists should create a vaccine that would eliminate arthritis.

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27. Scientists should create a vaccine that would eliminate emphysema.

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28. Scientists should create a vaccination that would eliminate AIDS.

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29. Scientists should create a vaccination that would eliminate breast cancer.

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30. Scientists should create a vaccine that would eliminate HPV.

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31. Scientists should create a vaccine that would eliminate prostate cancer.

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32. Scientists should create a vaccine that would eliminate heart disease.

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33. Scientists should create a vaccine that would eliminate herpes.

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34. When I was growing up, my parents stressed the importance of making sure my vaccinations were up-to-date.

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35. I remember my parents discussing vaccinations as an important part of my overall health.

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36. I believe that my parents think HPV vaccination is important for a person’s health.

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37. I would be more likely to get vaccinated against the human papillomavirus if one of my family members was vaccinated.

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38. I would ask at least one of my family members what they think about vaccinating against HPV if I was trying to decide whether to vaccinate.

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39. In choosing whether or not to get vaccinated against HPV, I would talk to my family.

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40. In choosing whether or not to get vaccinated against HPV, I would consider my families opinions.

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41. I am worried what my family would think of me, if I got the HPV vaccine.

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42. After I have made my mind up about vaccination, I would go through with my choice even if my family disagreed.

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43. In general, my family would think getting a yearly physical is important.

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44. In general, my family would think that getting a flu shot is important.

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45. In general, my family would think that using condoms or other forms of birth control is important.

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46. In general, my family would think that going to the dentist yearly is important.

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</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
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<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

47. In general, my family would think that taking vitamins is important.

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<th></th>
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</table>

48. If you were to purchase a new car, how much influence would your peers have in your decision making about which kind?

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49. If you were going on a date and needed new clothes for the date, how much influence would your peers have in your decision making about what you should buy?

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50. If you were to buy a new cellphone, how much influence would your peers have in your decision making about what kind you should buy?

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51. If you were looking to try a new restaurant, how much influence would your peers have in where you chose to eat?

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52. If you were fighting with your significant other, how much influence would your peers have in your decision making about what you should do about the disagreement?

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53. If you had just had a first date with a new romantic interest, how much influence would your peers have in your decision making whether you will see the date again?

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54. If you were angry with a friend, how much influence would your other friends have on how you handle the conflict?

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55. If you had flu-like symptoms, how much influence would your peers have in whether you decide to go to the doctor?

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56. If you were going to start an exercise plan, how much influence would your peers have in when deciding what and how much exercise to do?

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57. If you were deciding to get your cholesterol checked, how much influence would your peers have in deciding whether to get tested?

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58. My family and I have the same views about HPV vaccination.

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