Information Amount and Patient Empowerment:
Participation in the HPV Vaccination Decision-Making Process

Thesis

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Abstract

Health information is more often than not viewed as an efficient tool in enabling patients to become more active participants in health decision-making processes. This study investigates the effects of information amount on perceptions of patient empowerment (subjective empowerment self-efficacy) and behavioral intention. The proposed relationships are applied within the context of the human papillomavirus (HPV) vaccination decision-making process to assess the effects of information amount on college students’ (N = 101) intentions regarding vaccination. Results demonstrated that females have greater intention to discuss HPV vaccination with a physician than males. Participants in general preferred to discuss HPV vaccination with a physician prior to deciding whether to be vaccinated. Implications for understanding the effects of information amount and patient participation are discussed.
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Chapter 1: Introduction

Recently, there has been a shift in the process of receiving medical care. This shift, often referred to as health empowerment, relates to the role patients play when receiving medical care. Health empowerment is frequently defined as a combination of “knowledge, skills, and a heightened self-awareness regarding values and needs” to help patients reach their personal health goals (Feste & Anderson, 1995, p.140). Empowerment within the health context has frequently been operationalized in terms of how much patients participate in the medical decision-making process (Feste & Anderson, 1995).

Dupuits (2002) claims that the internet and other such information media have had significant influence on patients’ empowerment and their participation in the decision-making process. However, are high amounts of information always beneficial to patients? Broom (2005) says that for some patients with prostate cancer, internet health information has served as a source of empowerment, while for others, it has served as a source of confusion. Patients who seek health information in addition to information provided by physicians challenge the physician-patient relationship and can lead physicians to further limit collaboration in the treatment decision-making process (Broom, 2005). Further review of the effects of health information on patient empowerment and participation is warranted.
The context of HPV vaccination is a suitable application of the proposed model. The HPV vaccine is relatively new and yields risks and benefits for eligible patients. Knowledge of the human papillomavirus and its vaccine remains low among young adults who are eligible to receive the vaccine (e.g. Friedman & Shepeard, 2007; McPartland, Weaver, Lee, & Koutsky, 2005). With the vaccine’s recent approval, information regarding the virus and vaccine has become much more accessible; yet the effects of this information are not fully understood. This study thus assesses the relationship between information amount and patient empowerment, as well as the variables that further influence this relationship within the context of HPV vaccination.

**Empowerment**

The concept of empowerment remains ambiguous. Researchers often assert that empowerment is both a means and an end result (Rappaport, 1984; Zimmerman, 1990; Gibson, 1991; Narayan, 2005). Gibson (1991) defines empowerment as the process in which individuals or groups enhance their abilities to meet their needs and gain a sense of control of their lives. Gibson adds that empowerment can be also viewed as the end result of participatory decision-making, negotiation, collaboration, and/or education. Research also indicates that empowerment can occur at various levels including the individual, organizational, and societal levels (Zimmerman, 1990; Gibson, 1991; Narayan, 2005). At the individual level, empowerment is described as a family of variables that “includes participatory behavior, motivations to exert control, and feelings of efficacy and control” (Zimmerman, 1990, p. 169). This form of empowerment includes both individual perceptions (psychological aspects) and behavior.
Further adding to the confusion surrounding the conceptualization of empowerment, Webb, Horne, and Pinching (2001) refer to empowerment as the process in which patients and providers equally contribute to the health decision-making process. Webb and colleagues (2001) measure empowerment by asking participants generic questions about their perceived degree of involvement in and satisfaction with their treatment decisions. Thus, Webb and colleagues (2001) allude to the notion that empowerment is a reconceptualization of participatory decision-making. There hence appears to be some overlap and confusion among the constructs that relate to empowerment.

Roberts (1999) clarifies that previous research has defined empowerment as the relationship between health and power, an informed and active patient, an equal physician-patient relationship, and a type of health education. According to Roberts (1999), the various conceptualizations suggest that the psychological aspects of empowerment and empowered behaviors are likely to be intertwined.

This review of literature indicates that researchers remain conflicted over whether to examine psychological aspects of empowerment or behaviors resulting from the empowerment process (the process through which patients become informed and better equipped to participate in decision-making processes; Narayan, 2005; Riger, 1993). Distinguishing between both forms of empowerment is crucial in order to further understanding of the concept of empowerment. It is likely that perceptual empowerment is a prerequisite to successful enactment of empowerment. Perceptions of empowerment may be conceptualized as a form of self-efficacy, which are explained below.
Self-efficacy. Self-efficacy refers to an individual’s confidence that he or she is capable of performing a particular behavior to obtain a specific outcome (Bandura, 1977). According to Bandura (1977), perceived self-efficacy has a direct influence on an individual’s behavioral choices. Specifically, the greater an individual’s perceptions of self-efficacy, the more likely he or she is to utilize active efforts (Bandura, 1977). This may be applied in the health decision-making process in that the greater one’s perceptions of self-efficacy, the more likely one is to take an active role in the decision-making process. Consequently, Bandura (1977) posits a relationship in which treatment options influence an individual’s level of perceived self-efficacy, which in turn, leads to behavior. Self-efficacy may thus serve as the link between treatment options and behavior.

Research has differentiated between self-efficacy and empowerment by attributing self-efficacy as a result of the empowerment process. Accordingly, as patients become more active participants in the decision-making process, they become more self-efficacious as a result (e.g. Anderson, Funnell, Fitzgerald, & Marrero, 2000; Aujoulat et al., 2008). Thus, one may deduce that perceptions of empowerment are highly correlated with perceptions of self-efficacy (e.g. Vauth, Kleim, Wirtz, & Corrigan, 2007). Vauth and colleagues (2007) describe that self-efficacy is often used to refer to how confident an individual is that he or she can participate in the health decision-making process. Similarly, empowerment has been described as an individual’s perceived capability of participating in the decision-making process (Vauth et al., 2007). Perceptions of ability and confidence in ability appear to be highly interrelated.
Therefore, self-efficacy appears a useful way to conceptualize and study the perceptual side of empowerment, in a way that is likely to predict actual enactment of empowerment. In terms of the current study, perceptions of empowerment are best thought of as an individual’s perceptions of control and ability to participate in the decision-making process. This conceptualization will be referred to as subjective empowerment self-efficacy (SESE). Consistent with earlier arguments, it is anticipated that SESE is related to empowered behaviors.

Behavioral Intention

Due to the nature of the current study, empowered behaviors will be assessed using behavioral intention. Prior studies have found a high correlation between behavioral intention and behavior such that intentions to perform a particular behavior are typically predictive of later engagement in the behavior (e.g. Ajzen & Fishbein, 1974, 1984; Sheppard, Hartwick, & Warshaw, 1988). Consistent with previous research, it is expected that intentions to talk to a physician about the HPV vaccine or decide whether to become vaccinated will be highly correlated with the actual behaviors. Hence, measuring the relationship between SESE and behavioral intention, as a proxy for enacted empowerment, is justified, given the lack of opportunity in this experimental setting to study actual behavior.

Specifically, it is worth investigating whether SESE influences patients to talk to their physician about an issue or to make a health decision on their own. Patients respond to health information differently: some may be better equipped to make their own health decision while others may wish to first discuss matters with their physician. Roberts (1999) says that some patients prefer to simply be given information about their condition
while others wish to have full control over their health management. As previously suggested, it is likely that perceptions of empowerment will lead to enacted empowerment. It is thus expected that perceptions of ability to participate in the decision-making process will predict intentions to participate:

H1: Subjective empowerment self-efficacy (SESE) will predict intention to a) discuss the HPV vaccine with a physician, and b) decide whether to be vaccinated for HPV, after controls.

Information Amount

Today, patients have the ability to receive greater amounts of information than ever before. With the advent of the internet, patients have better access to health information sources and are in a better position to take some control in their health decision-making than ever before (Dupuits, 2002). The internet has begun to serve as a significant component of patient self-education and may have varying effects on patients’ health (Broom, 2005).

Assessing internet usage among men with prostate cancer, Broom (2005) further investigates the connection between empowerment and the physician-patient relationship. Broom (2005) found that those who benefited from information obtained through internet usage did so by using the internet as a coping strategy and a means of gaining more control over their illness. Results also demonstrate that internet usage among patients created some limitations in the physician-patient relationship such that several physicians became defensive when confronted by “empowered” patients (Broom, 2005). Broom (2005) concludes that the utilization of the internet in medical decision-making helps promote healthy decision-making for some patients; while creating barriers for others.
Research therefore suggests that information sought by patients influences patient empowerment.

Zachry, Dalen, and Jackson (2003) found that overall, physicians are willing to extend their interaction with patients due to increased questioning by patients; however, when increased questioning results from below-par sources, physicians are less willing to provide full information to their patients. Thus, depending on patients’ contribution to the medical consultation, patients may receive varying amounts of information from their physician (Cegala, Street, & Clinch, 2007). There currently has been little research done to specifically investigate the effects of different amounts of information on patients. It is worthwhile to assess how information amount influences individuals’ perceptions and behaviors associated with empowerment and the decision-making process.

*Information overload.* According to Chen, Chang, and Kao (2009), humans have limited information processing capacity. As amounts of information increase, humans tend to increase their processing efforts accordingly. When individuals are confronted with more information to process than they are able or willing to process, however, they may perceive themselves as experiencing information overload. Perceptions of overload are the result of the interaction between high amounts of information and limited processing capacity (Chen et al., 2009). When processing limits are surpassed, overload occurs and an individual may be left confused and more likely to make poor decisions as a result (Malhotra, Jain, & Kagakos, 1982).

Research has indicated the difficulty and even impossibility of finding an exact threshold of information overload (e.g. Chen et al., 2009; Malhotra, Jain, & Lagakos, 1982). Instead, it is more likely that due to individual differences, humans have
individual thresholds of information overload (Chen et al., 2009). More research is still needed in assessing the predictors of information overload and the factors that influence an individual’s threshold.

Hay, Coups, and Ford (2006) found that individuals who self-reported as experiencing cancer prevention information overload perceived themselves to be at higher risk for contracting colon cancer than those who did not feel overloaded. Hay and colleagues claim that individuals who perceive themselves at highest risk for colon cancer may be unable to prioritize the most urgent proposed behavior changes (2006). Hay and colleagues recommend that additional interventions help alleviate information overload through message targeting (2006). It is still unclear, however, as to what constitutes information overload producing messages.

Health information, including information provided by a physician as well as information sought by a patient, may have varying effects on a patient. It appears as though the information provided by a physician may allow patients to feel more empowered and efficacious; however, such information may also confuse patients and ultimately hinder the decision-making process. While a great deal of literature suggests that information is a useful tool in increasing a patient’s empowerment; other literature suggests that extreme amounts of information lead patients to information overload and confusion (e.g. Malhotra, Jain, & Kagakos, 1982; Hay, Coups, & Ford, 2006). Therefore, it is hypothesized that the amount of information with which an individual is presented will have varying effects on his or her perceptions of empowerment. This proposed relationship is expected to take on a curvilinear (inverted U) relationship such that
information amount is positively related to SESE, until a certain point at which information overload occurs and the relationship becomes negative.

H2: Information amount will have a non-linear (inverted U) relationship with subjective empowerment self-efficacy.

In addition to information amount influencing perceptions of empowerment, it may also be possible that information amount influences behavioral intention. Chen (2009) found that when individuals were not aware of the prevalence of a disease, higher amounts of information were associated with increased self-protective behavior. Within the current study, informative articles discussing HPV and the vaccine may provide new information for participants about the prevalence of the virus. Perhaps then higher amounts of information would increase intention to become vaccinated or to discuss the vaccine with a physician.

H3: Information amount will predict behavioral intention, after controls.

**Personality Factors**

Other factors that have been associated with the decision-making process include the need for cognition (NFC) and issue involvement. The need for cognition relates to an individual’s engagement in and enjoyment of the thinking process (Cacioppo & Petty, 1982; Boukenooghe, Vanderheyden, Mestdagh, & Van Laethem, 2007). Subsequently, those with a higher need for cognition tend to seek more information and assess more options during the decision-making process than those in lower need for cognition (Cacioppo & Petty, 1982; Boukenhooghe et al., 2007). In relation to the present study, it is predicted that those with a higher need for cognition will be more willing to sort through literature of various treatment options and play a more active role in the decision-
making process. Thus, those with high NFC will perceive themselves as more capable of participating in the decision-making process:

H4: The need for cognition will predict subjective empowerment self-efficacy (SESE), after controls.

Another variable that may be related to SESE is that of issue involvement. Issue involvement refers to the degree of personal relevance and importance of an issue to an individual (Petty & Cacioppo, 1979). According to Petty and Cacioppo (1979), issue involvement increases one’s motivation to process information. Thus, in terms of the current study, when an individual is presented with health-related information, his or her motivation to process the information may be somewhat dependent on his or her involvement with the issue. Petty and Cacioppo (1979) also found that higher levels of issue involvement were correlated with higher levels of message recall. Accordingly, individuals who are more involved with an issue may be thus more motivated to process information regarding the issue and more likely to recall the information with which they are presented (Petty & Cacioppo, 1979).

While there is a significant lack of research examining the relationship between issue involvement and empowerment (especially within a health context), Rutten and Iannotti (2003), found that women with greater levels of issue involvement are more likely to adhere to suggestions of screening options for breast cancer. It is therefore predicted that individuals with greater levels of issue involvement will be more motivated to find the treatment option that is best for them. Thus:

H5: Issue involvement will predict subjective empowerment self-efficacy (SESE), after controls.
According to Frymier and Nadler (2007), higher levels of personal involvement with an issue increase an individual’s motivation to centrally and critically process the information. By critically processing the information, an individual may find the decision-making process easier once all of the related information is understood. By being motivated, individuals may be more likely to perceive themselves as efficacious in the decision-making process.

Similarly, Chen and colleagues (2009) assert that personal experiences can serve as filtering mechanisms in processing information. By relating information to past experiences, decision makers can choose which pieces of information are most recognizable and can influence their decision strategies accordingly (Chen et al., 2009). This application of past experiences and recognizable information gets at some notions of issue involvement. Therefore, it may be argued that issue involvement may serve as a filtering mechanism. Thus:

RQ1: Does issue involvement mediate the relationship between information amount and SESE?

It is further hypothesized that the aforementioned personality factors, while being directly related to SESE, may also moderate the relationship between information amount and SESE. Such psychological factors (need for cognition and issue involvement) may make an individual more likely to seek information and thus more likely to be empowered. Perhaps the effects of information amount are contingent on these psychological factors. As previously mentioned, the need for cognition and issue involvement provide individuals with more motivation to process information. Thus, different levels of motivation may further affect the relationship between information amount and SESE.
amount and SESE such that individuals with higher levels of need for cognition or issue involvement may experience less of an effect of information amount than those with lower levels.

H6: The relationship between information amount and subjective empowerment self-efficacy (SESE) will be moderated by a) need for cognition and b) issue involvement, so that the U-shaped function previously hypothesized is found to decrease or disappear for those high in NFC or issue involvement.

It is clear that not all patients are the same or that they prefer to have the same amount of control over their health decisions (Roberts, 1999). Since patients have different levels of empowerment and thus different expectations from the physician-patient relationship (Roberts, 1999), it may be possible that reactions to health information may be in part dependent on an individual’s perception of empowerment. Patients with greater levels of subjective empowerment self-efficacy may be better able to make a health decision resulting from exposure to health information. Patients with lower levels of SESE may wish to have others make the decisions for them. It is thus worth probing to determine the possibility that SESE may serve as a moderator between health information and subsequent health decisions.

H7: SESE will moderate the relationship between information amount and behavioral intention.

The proposed model, while somewhat complex, may provide some fruitful implications for health professionals and patients. Figure 1 demonstrates the proposed relationships among the variables of interest.
Figure 1. Box and Arrow Model of Variables of Proposed Study

*Human Papillomavirus (HPV)*

The proposed model will be applied to the health context as it pertains to the decision making process of human papillomavirus vaccination. The human papillomavirus (HPV) is a common sexually transmitted disease (STD). Of the various sexually transmitted diseases, the human papillomavirus has the greatest number of new cases a year and accounts for roughly one-third of all STD cases (Centers for Disease Control and Prevention; American Social Health Association, 2008). Certain strains of HPV (types 6 and 11) cause 70% of cervical cancer and 90% of genital warts cases (types 16 and 18) (Centers for Disease Control, 2006). Young college-aged adults are especially at risk for HPV infection (National Institutes of Health, 1998).
Being that there is currently no cure for the human papillomavirus, it is important to prevent or help develop immunity to the virus. In June 2006, the U.S. Food and Drug Administration (FDA) approved a vaccine, Gardasil, which prevents the strains of HPV that cause cervical cancer and genital warts. The vaccine is recommended for girls and women between the ages of 9 and 26 (U.S. Food and Drug Administration, 2006). However, a similar vaccine is expected to soon be available for males (Dempsey & Freed, 2008). The current vaccine is most effective when given to women who are not already infected with types 6, 11, 16, or 18. Studies have demonstrated that the vaccine is nearly 100% effective in preventing infection associated with the four aforementioned types (Gostin & DeAngelis, 2007).

Gardasil is given as 3 injections over a 6 month period. Each dosage costs $120 adding up to a total of $360 for full vaccination (National Cancer Institute, 2007). Insurance coverage of the vaccine varies among providers and types of plans. The long-term effects of current HPV vaccines remain unknown. According to Merck, the company that produces Gardasil, the vaccine “can cause pain, swelling, itching, and redness at the injection site, fever, nausea, and dizziness” (Merck & Co, 2007). Additional barriers to HPV vaccination include acceptance of the vaccine, which has been difficult due to the sexually transmitted nature of the virus (Dempsey & Freed, 2008).

Research indicates that knowledge of the human papillomavirus and its vaccine is significantly lacking among male and female college students (e.g. Friedman & Shepeard, 2007; McPartland, Weaver, Lee, & Koutsky, 2005). Being that the vaccine was recently approved, it is likely that more information regarding the vaccine and virus will
be available to the general public. It is thus necessary to determine the effects of HPV-related information on college students—individuals eligible to receive the vaccine—and the vaccination decision-making process.

*HPV and issue involvement.* With the relatively recent acceptance of the HPV vaccine for females and not yet available vaccine for males, it is worth investigating gender differences among the main variables of interest. First, it is possible that gender and issue involvement (as it pertains to HPV vaccination) may be related. McPartland and colleagues (2005) suggest that males perceive their female counterparts to be more vulnerable to and affected by HPV infection. Do females also consider themselves to be more vulnerable to infection? It is worth investigating the nature of the relationship between issue involvement and gender. Thus:

RQ2: What is the relationship between issue involvement and gender?

Similarly, research has suggested that females participate more than males within the medical consultation (e.g. Levinson, Kao, Kuby, & Thisted, 2005; Flynn et al, 2007; Florin, Ehrenberg, & Ehnfors, 2008). No known studies have investigated gender differences in perceptual empowerment in relation to the HPV vaccination decision-making process. Limited research has examined gender differences of participation in the medical decision-making process for young adults. It is of interest to explore any possible differences. Thus:

RQ3: Are there gender differences in SESE for talking to one’s doctor about the HPV vaccine?

Returning to the notion of issue involvement, it may be useful to determine the predictors of issue involvement regarding HPV. Doing so may enable practitioners to
predict an individual’s feelings of risk or concern of HPV, which may in turn predict an individual’s likelihood to be vaccinated. Assessing predictors of perceptions of risk or concern for HPV may also help public health professionals reexamine their current messages about the virus and vaccine. Thus:

RQ4a: What predictors of issue involvement exist?

It is possible that if we control for perceptions of risk and concern for HPV, that gender differences may exist. If gender differences do exist, it would be interesting to determine why. If gender differences do not exist after controlling for issue involvement, it may be due in part to gender differences in general patient habits. Explaining such potential gender differences may provide practitioners with insight into why some patients engage in active patient participation while others do not. Thus:

RQ4b: If we control for issue involvement, do gender differences exist in SESE—and if so—what could the differences signify?

Investigating these proposed questions and hypotheses will provide practitioners with knowledge helpful for determining the effects of health information amount on patient participation. Knowing the effects of patient empowerment on the relationship between information and related health decisions may demonstrate potential barriers to the effectiveness of health information. It is worth examining these relationships in an attempt to better suit the information needs of patients.
Chapter 2: Method

As previously discussed, the current study seeks to assess the relationship between information amount and subjective empowerment self-efficacy (SESE) as well as the factors that moderate this relationship within the context of HPV vaccination.

Participants

A total of 202 undergraduate students taking communication courses at a large, Midwestern university were recruited to participate in this study. Participants were awarded extra-credit in certain communication courses for their participation. College students are an appropriate population to examine due to the relevance of HPV and their general lack of knowledge of the virus and vaccine.

A loss of data occurred, resulting in a sample of 101 participants\(^1\). The current sample ranged in age from 18 to 34 (M = 19.93, SD = 2.036). The sample consisted of 33 males (32.7\%) and 68 females (67.3\%), with 33 (32.7\%) Catholic, 18 (17.8\%) Protestant, 10 (9.9\%) Orthodox Christian, 7 (6.9\%) Jewish, 11 (10.8\%) other, and 20 (19.8\%) Agnostic or having no religion. When asked their cumulative number of sexual partners, 24 (23.8\%) reported no sexual partners, 56 (55.4\%) had between 1 and 4 sexual partners, and 21 (20.8\%) had more than 5 total sexual partners.

\(^1\) Preliminary analyses conducted before data loss yielded similar findings.
Procedure

Each participant first completed a brief pretest assessing their existing knowledge of HPV and the vaccine. The pretest also assessed participants’ level of empowerment (within the physician-patient relationship), need for cognition, and involvement with HPV and its vaccine. Participants were randomly assigned to one of four conditions: control group with no information (n = 22), group receiving little information (n = 24), group receiving moderate information (n = 26), or group receiving great amount of information (n = 29; given loss of data).

On a separate computer, each participant in the experimental conditions was given information regarding the risks and benefits of HPV vaccination (see Appendices A-C). In order to keep the different experimental conditions standardized, the slanted information within each condition was 60% positive and 40% negative concerning HPV vaccination. The slanted information was assessed by calculating the sum of sentences discussing benefits of the vaccine versus the sum of sentences discussing drawbacks. Participants were given the opportunity to read at their own pace, provided that they complete the study within the 1-hour session.

After reading the HPV information, participants completed a posttest questionnaire to further assess the relationships among the variables of interest. The posttest investigated the effects of the information. The posttest additionally assessed participants’ confidence and intentions to participate in the decision-making process resulting from the information with which they were presented.

As the HPV vaccine has currently been approved for females only, participants were advised that a similar vaccine is likely to become available for males in the near
future. Male participants were thus instructed to respond in such a way that is consistent with their intentions if the vaccine were to be approved for males very soon. Upon completion of the posttest, participants were debriefed and later given their extra-credit points.

Design

The current study was set up as a one-factor between-subjects design with random assignment and moderators studied as continuous covariates. The factor was information amount and had three levels: low, moderate, and high. A control group was also used which did not receive any information. All groups, including the control group received both the pretest and posttest. The pretest and posttest measured different variables.

Independent Variables

Empowerment. In an attempt to measure participants’ levels of empowerment, the Treatment Empowerment Scale was administered (TES; Webb, Horne, & Pinching, 2001). The TES relates to generic empowerment and physician-patient relationships. Items from the scale were administered in the pretest to capture individual’s baseline empowerment (see Appendix D).

Information amount. As discussed, participants were presented with varying amounts of information. The information provided consisted of several paragraphs summarizing arguments of the pros and cons of HPV vaccination. Each piece of information was from a credible source such as: Merck (the manufacturer of Gardasil), the American Cancer Society, Centers for Disease Control and Prevention, and the National Cancer Institute. The sources used for the purposes of this study are governmental or accredited health organizations; reputable sources for health information
and serve as credible sources for the purposes of the current study. When a search on Google.com for “HPV vaccine” was conducted, the utilized sources were within the first five screens. Thus, these sources are expected to be similar to sources which the general public would use to acquire information about the HPV vaccine.

Previous research (e.g. Malhotra, 1982) operationalizes information overload in terms of the number of attributes of a particular brand or decision option. Malhotra (1982) further describes that information overload results from increased quantity and quality of information. Previous literature on information overload, however, remains uncertain as to the specific number of attributes that signifies overload. The current study operationalized information overload according to the quantity of HPV vaccine information. Holding the types of sources, complexity of information, and main points constant, the amount of information and number of sources differed among the experimental groups. Specifically, the low condition consisted of roughly 1 page of information (258 words), the moderate condition was about 2.3 pages (649 words), and the high condition was 4.5 pages of information (1,374 words). As the number of paragraphs increased, the number of sources increased as well. All conditions had a readability level of 10.2 with the information paraphrased from the websites previously mentioned, to ensure that amount of information was not confounded with comprehensibility of presentation. The high information condition was constrained by the amount of time available to carry out this research study on a volunteer, extra-credit basis.

To determine the effects of the amount of information on participants, they were asked questions about the comprehensibility of the information (see Appendix E).
Need for cognition. Cacioppo, Petty, Feinstein, and Jarvis (1996) developed an 18-item short form of the Need for Cognition Scale (NCS). The 18-item NCS was highly correlated with the original 34-item NCS \((r = .95, p < .001)\), and possessed high internal consistency \((\alpha = .90)\). Eight items from the short form of the NCS (which was too long for use in this experimental session) were administered to participants in the current study, (see Appendix F).

Issue involvement. Petty and Cacioppo (1979) in studying issue involvement, manipulated involvement by providing participants with a vignette depicting an issue as either proximally relevant or irrelevant to participants. Using Petty and Cacioppo (1979) as a model, participants within the current study were asked questions regarding how concerned they were about HPV and related STDs (HIV/AIDS, herpes, genital warts, cervical cancer) occurring to them or their partner in an intimate relationship. Concern items used a 7-point scale where 1 = “not at all concerned” and 7 = “extremely concerned.” Concern items were highly reliable (Chronbach’s \(\alpha = .94\)). Participants were also asked to indicate their level of perceived risk for HPV infection considering the risk factors, on a 7-point scale where 1 = “not at all at risk” and 7 = “at extreme risk.”

Dependent Variables

Subjective empowerment self-efficacy. SESE was examined by adapting items from the Adherence Self-Efficacy Scale (Johnson, Neilands, Dilworth, Morin, Remien, & Chesney, 2007) and the Treatment Empowerment Scale (TES; Webb, Horne, & Pinching, 2001). As previously mentioned, the TES reflects generic empowerment and the physician-patient relationship. It was intended that these items would become domain
specific. For the purposes of the current study, these items were adapted by relating to HPV vaccination and participation in the decision-making process.

As previously discussed, SESE is operationalized as an individual’s confidence and perceived ability to participate in the decision making process. This operationalization closely resembles the Adherence Self-Efficacy Scale. However, the TES gets at notions of empowerment as well. It was therefore expected that combining the Adherence Self-Efficacy and Treatment Empowerment Scales would better capture the notion of SESE (see Appendix G).

**Behavioral intention.** Behavioral intention is operationalized as individuals’ intent to discuss the HPV vaccine with their physician and ultimately make a decision as to whether or not to receive the vaccine. Six items assessed the intentions of participants (see Appendix H).
Chapter 3: Results

Data Analysis

The first, fourth, and fifth hypotheses were addressed using multiple linear regressions to assess the relationships between subjective empowerment self-efficacy (SESE) and behavioral intention, need for cognition (NFC), and issue involvement. Each regression analysis controlled for age, gender, and the number of sexual partners.

Analyses of covariance (ANCOVA) were conducted to assess the remainder of the hypotheses and research questions. The ANCOVA additionally examined variance attributable to information amount, issue involvement, SESE, and gender. Interactions among variables of interest were incorporated in the analyses. Planned contrasts tested for differences among the experimental conditions (low, moderate, and high amounts of information).

Hypothesis Tests

H1 posited that SESE would predict intention to a) discuss the HPV vaccine with a physician and b) decide whether to be vaccinated for HPV. This hypothesis was partially supported. After controlling for potential confounds, the intention to discuss the HPV vaccine with a physician was significantly predicted by SESE, $\beta = .156$, $p < .05$. Participants’ intention to decide themselves whether to be vaccinated for HPV was not significantly predicted by SESE after controls, $\beta = .164$, $p = .062$. 
An additional analysis explored the relationship between empowerment and SESE. The two variables were significantly associated, \( r = .208, p < .05 \). After controls, empowerment was a significant predictor of SESE, \( \beta = .504, p < .05 \).

Before testing effects of information amount on outcome variables, we examined effects of the treatment conditions on our measures of subjective information overload. Treatment conditions were not significantly predictive of reported information overload (\( p = .66 \)).

H2 predicted a non-linear relationship between information amount and SESE. Prior to controlling for confounds, the relationship was not significant. After controls, there were small, yet significant differences in the effects of information amount on SESE, \( F(3, 101) = 3.233, p < .05, \eta^2 = .094 \) (see Appendix I). Contrasts were then conducted to compare the different experimental conditions against the control condition. No significant differences were found between experimental conditions and the control condition; the significance of the overall test appears to be due to the differences between moderate and high information, in a direction inconsistent with hypotheses.

An additional analysis investigated the relationship between information overload and subjective empowerment self-efficacy. Despite no clear evidence that overload has occurred, scores on the overload scale were found to be a significant predictor of SESE, \( \beta = -.849, p < .001 \).

Similarly, H3 expected that information amount would predict behavioral intention. After controls, information amount did not significantly predict intention to discuss the HPV vaccine with a physician (\( p = .070 \)), intention to decide whether or not to be vaccinated for HPV (\( p = .634 \)), or score on the behavior intention scale (\( p = .371 \)).
The next three hypotheses and research question assessed the factors that may potentially influence the relationships among the main variables of interest. H4 and H5 expected SESE to be predicted by need for cognition and issue involvement, respectively. Need for cognition was not significantly predictive of SESE, $\beta = .596$, $p = .091$. Regarding issue involvement, SESE was not significantly predicted by self-perceptions of risk for HPV, $\beta = .147$, $p = .240$, or feelings of concern for HPV and similar STDs, $\beta = .051$, $p = .520$.

H6 then predicted that the relationship between information amount and SESE would be moderated by a) need for cognition and b) issue involvement. When need for cognition was entered into the model, information amount was found to significantly predict SESE, $F(3,101) = 4.866$, $p < .01$, $\eta^2 = .213$. The need for cognition did not significantly predict SESE, $F(14,101) = 1.316$, $p = .229$. However, the interaction of information amount and need for cognition was significant, $F(26,101) = 2.061$, $p < .05$, $\eta^2 = .498$. After probing the interaction, the interaction does not seem meaningful, nor is it in the form originally predicted. It appears as though an anomaly in condition 3 occurred (one participant in condition 3 had an SESE score of 1.25 while the minimum score for all others was 2.50).
When issue involvement (risk and concern) was included in the model, information amount, issue involvement, and the interaction of information amount and issue involvement were not significant.

RQ1 investigated whether issue involvement mediates the relationship between information amount and SESE. According to the Baron and Kenny approach (1986), since there were no significant effects of information amount on issue involvement or issue involvement on SESE, it is unlikely that significant mediation is occurring within this relationship.

H7 proposed that the relationship between information amount and behavioral intention would be moderated by SESE. In addition to information amount not significantly predicting behavioral intention, SESE did not significantly predict behavioral intention, $F(20,101) = 1.532$, $p = .115$. The interaction of information amount

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**Figure 2. Interaction of Need for Cognition and Information Amount**
and SESE is, however, significant in predicting behavioral intention, $F(27,101) = 1.947$, $p < .05$. Probing the interaction suggested that information amount had little effect on individuals with high SESE, while information amount slightly increased behavioral intentions for individuals with less confidence.

![Interaction of information amount and SESE](image)

**Figure 3. Interaction of Information Amount and SESE**

The regressions lines for the different conditions are plotted.
The final sets of research questions further examined the roles of issue involvement and gender within the proposed model. RQ2 assessed the relationship between issue involvement and gender. Simple correlations between gender and risk and concern were not significant. Regression analysis revealed that gender did not significantly predict issue involvement ($p = .347$). Similarly, RQ3 examined gender differences in SESE. Gender was found to be a significant predictor of SESE, $F(1, 101) = 38.521$, $p < .001$, $\eta^2 = .133$, with higher SESE scores for females (M = 5.890, SD = 1.248), than for males (M = 4.311, SD = 1.425).
RQ4a investigated differences in issue involvement. After controls, the number of sexual partners was found to significantly predict perceptions of risk for HPV such that participants with zero sexual partners felt less at risk (M = 1.58, SD = .929), than those who had one to four partners (M = 2.13, SD = 1.063), and those who had five or more partners (M = 2.90, SD = 1.338); $F(1, 101) = 15.181, p < .001$. The number of sexual partners was the only significant predictor of issue involvement.

RQ4b then assessed if we control for issue involvement whether gender differences exist in participants’ empowerment. After controlling for issue involvement and other controls, gender was still a significant predictor of SESE such that females (M = 5.890, SD = 1.248) had greater levels of SESE than males (M = 4.311, SD = 1.425), $F(1, 101) = 32.242, p < .001$, $\eta^2 = .266$. Similarly, after the same controls, gender was also a significant predictor of intention to discuss the HPV vaccine with a physician such that females (M = 3.603, SD = 1.053) are more likely to discuss the vaccine with their physician than males (M = 2.727, SD = .977), $F(1, 101) = 15.472, p < .001$, $\eta^2 = .148$. In addition, gender was a significant predictor of intention to make one’s own decision about the HPV vaccine such that females (M = 3.168, SD = 1.197) report greater intention than males (M = 2.849, SD = .939), $F(1, 101) = 7.203, p < .01$, $\eta^2 = .075$. 
Chapter 4: Discussion

The aim of this study was two-fold: a) to assess the relationships among subjective empowerment self-efficacy, information amount, and behavioral intention, as well as the factors that influence those relationships, and b) to test the assumption that there are limits in the effectiveness of information amount.

Some significant relationships were found among the variables of interest. First, the notion of SESE was found to have some predictive ability as it relates to behavioral intention. SESE was defined in this study as perceptions of control and ability to participate in the decision-making process. SESE was found to be a better predictor of intention to discuss the HPV vaccine with a physician than intention to make one’s own decision about HPV vaccination. Thus, the more one is confident in one’s ability to participate in the decision-making process, the more likely one is to discuss the vaccine with a physician, and—to a lesser extent—the more likely one is to make one’s own decision about HPV vaccination.

While SESE was found to have predictive ability, other factors were found to predict SESE. General empowerment was found to significantly predict SESE after exposure to HPV-related information. A significant overall effect of information amount was also found to influence SESE. However, predictions regarding the curvilinear relationship of information amount were not supported, which was unsurprising given that the longer messages evidently were not long or complex enough to create subjective experiences of overload in this college student population. Also, the messages did not
result in significant increases in SESE relative to the control condition. Thus, there is no clear effect of information amount.

The interaction of information amount and need for cognition—although significant—did not provide any meaningful implications. It is possible that some of these findings were due to outliers. However, the interaction of information amount and SESE in predicting behavioral intention was significant and after probing, suggests that individuals who are less confident about their ability to participate in the decision making process may be more affected by information than those who are highly confident. It is important to note that SESE was assessed after exposure to information and should thus be taken into consideration when interpreting these findings.

One of the most interesting findings of this study is that gender is a strong predictor of SESE in relation to HPV vaccination. Females report a greater confidence in their ability to participate in the HPV vaccination decision-making process than do males. After controlling for prior issue involvement, females were found to have greater levels of SESE, intention to discuss HPV vaccination with a physician, and intention to make their own decision about HPV vaccination than do males.

**Practical Implications**

These findings yield some interesting implications for health care providers and patients. The analyses suggest that overall, participants are more willing to discuss HPV vaccination with their physician than to make their own decision about whether or not to be vaccinated. This finding is consistent with literature that suggests that while many patients wish to be active participants in the medical decision-making process, they do
not wish to have full control over their health-related decisions and wish to have their physician assist in health decision-making (e.g. Flynn et al., 2007; Florin et al., 2008).

As previously discussed, one of the main goals of this study was to investigate the effects and limitations of information amount. Being that the study sample was college students, it is expected that there was not much variance in the information processing ability of the participants relative to what might be found in a general population study. It is recommended that future research place stressors on participants to reduce their cognitive capacity in an attempt to assess information overload.

It is worth discussing the relationship between general empowerment and subjective empowerment self-efficacy. The two variables were closely related and general empowerment was predictive of SESE. It should be noted that the empowerment items assessed general patient participation and beliefs regarding the physician-patient interaction. SESE assessed confidence in the ability to participate in the HPV vaccination decision-making process after exposure to related information. It is important to distinguish between the two conceptualizations as general patient empowerment may help serve as a boundary condition in terms of effects on SESE. Future research may benefit from further exploring the fruitfulness of distinguishing between context-specific perceptions of empowerment versus general patient empowerment.

This study revealed some interesting implications of gender. Females consistently reported greater ability and intention to participate in the HPV decision-making process. These findings are consistent with the idea that females are typically more active medical participants than males (e.g. Levinson, Kao, Kuby, & Thisted, 2005; Flynn et al, 2007; Florin, Ehrenberg, & Ehnfors, 2008). Since the male vaccine is not yet available, it is
possible that males are less likely to intend to discuss the vaccine with their physician in the near future. Likewise, it is also conceivable that males do not yet view a male HPV vaccine to be effective.

Current media campaigns discussing the HPV vaccine only discuss the vaccine and virus as they pertain to females. It is thus possible that males are still unaware of their personal risk for HPV. These findings are consistent with McPartland and colleagues (2005) who found that college-aged males are generally not very familiar with HPV and consider females to be more vulnerable to and affected by the virus. Should the male vaccine become available soon, it is recommended that campaign efforts discuss the risk of HPV infection for males as well as the vaccine’s effectiveness in preventing HPV diseases for males.

Gender differences in SESE remained even after controlling for prior issue involvement. This suggests that despite perceptions of risk and feelings of concern about HPV, females are more efficacious in their ability to participate in the HPV decision-making process. Perhaps these differences are due to the newness of information such that males are not as familiar with HPV and the vaccine as females (McPartland et al., 2005). Variability in the novelty of information may influence behavioral intentions or feelings of efficacy. It is suggested that future research investigate the effects of the newness of information.

Also consistent with previous research about knowledge of HPV and its vaccine, this study’s findings indicate that the number of sexual partners is the most significant predictor of perceptions of risk for HPV infection. While increased numbers of sexual partners is a significant risk factor for HPV, it is not the only risk factor. It is thus
recommended that future campaigns regarding HPV discuss the various risk factors of the virus so that individuals can accurately ascertain their personal risk for infection.

Limitations and Future Research

Several limitations within the current study are worth discussing. First, the sample used within the study limits the generalizability of the findings. As previously mentioned, a technological error resulting in the loss of about 100 participants had occurred. The resulting 101 participant sample size is relatively small and reduces power among the findings. The method of recruiting participants also may have limited some variability in participants’ characteristics. As with most research utilizing samples of college students, the results cannot be generalized to other populations. It would be of interest to assess the relationships among the variables using samples of different populations.

It is worth addressing some operationalization discrepancies among SESE and behavioral intention. As previously discussed, SESE was conceptualized as an individual’s perceptions of control and ability to participate in the decision-making process, while behavioral intention was conceptualized as intentions to participate. Items used within the two scales did not necessarily coincide. In hindsight, some validity may have been preserved had items from the two scales matched more closely.

In addition, the information messages within the current study were designed in accordance with knowledge acquisition only. It was anticipated that the messages would increase knowledge regarding HPV and its vaccine. In accordance with social cognitive theory, it is also possible to include other elements within information messages—specifically skill acquisition or modeling (Jourden, Bandura, & Banfield, 1991). Jourden and colleagues (1991) found that individuals who perform a task under the assumption
that ability is an acquired skill are more likely to grow in their perceived self-efficacy than individuals who perform a task under an inherent-aptitude assumption. Likewise, previous studies have found participant modeling to yield greater perceptions of efficacy (Bandura, Adams, & Beyer, 1977). Including other elements—such as skill acquisition or modeling—within messages may be interesting to assess in the future.

One potential method to promote participatory decision-making skill acquisition is through the application of the PACE system (Cegala, McClure, Marinelli, & Post, 2000; Cegala, Post, & McClure, 2001). The PACE system is a method through which patients are taught skills to become more active and effective participants within the medical consultation. The system includes: presenting details about how the patient is feeling, asking questions if provided information appears inadequate, checking understanding of given information, and expressing concerns regarding treatment (Cegala et al., 2000, 2001). Incorporating these skills within a message may promote enhanced skills among patients, ultimately resulting in greater confidence to participate in the decision-making process as well as greater intentions to actively participate. These skills may fit nicely into a model of SESE and behavioral intention.

Another limitation within the current study is the way in which information amount was assessed. The different informational articles were not pretested prior to their use within the study (our ability to require reading of more extensive stimuli was limited given use of volunteer participants and associated time constraints). It is likely that even the high information amount article was not long enough to produce overload among college students, who are accustomed to reading technical materials. It is recommended that information be pretested in the future in order to determine how much information is
“too much,” and that non-student populations be used where possible. With students, manipulations to increase processing load, such as distracters and time limits, might possibly be employed successfully.

Similarly, it is important to note that information overload can occur as a result of various characteristics of information, in addition to the amount of information and number of sources. As Lurie (2004) points out, information overload is better predicted when structural qualities of information are taken into consideration as well as the amount of information. Some structural dimensions that are worth investigating include the number of alternatives, the number of attributes, and the distribution of attributes across alternatives (Lurie, 2004). Thus, it is possible that differences in the amount of information alone do not produce the most optimal information overload manipulation. HPV vaccination may also be a simpler decision than some in terms of alternatives, and may not have been the optimal topic for a study regarding information overload.

Inducing information overload among college students within a lab setting is challenging. Some possible manipulations that may be successfully employed in future studies include emotional stress, timeliness of decisions, number of decision options, and the pros and cons of each decision option. Additional contexts—preferably those that involve several different options or require more timely decisions—may be utilized to test the proposed relationships. Lang, Chung, Lee, Schwartz, and Shin (2005) suggest that cognitive overload may occur as a result of continuous stimuli (such as television and radio messages) in comparison to user controlled stimuli (such as newspapers or books). Perhaps future studies may benefit from utilizing continuous stimuli with college student populations to promote information overload.
As previously mentioned, it is suggested that future studies apply the proposed model to more general populations. In a national survey, Kim, Lustria, Burke, and Kwon (2007) found that low education level, low socioeconomic status, poor health status, and low media attentiveness were associated with cancer information overload. Applying these variables to a general population study may be beneficial. It is thus recommended that some variance exist in psychological, intellectual, and/or socioeconomic characteristics of participants.

Furthermore, this study did not measure the amount of information processing in which participants engaged while reading the information articles. It would be beneficial to measure and investigate differences in information processing among participants. It is possible that some participants may have skimmed the articles and only read information they deemed as pertinent, thus peripherally processing the material (e.g. Cacioppo & Petty, 1984). It is also possible that participants in the high information amount condition perceived the length and number of sources of the information as heuristic cues indicating that the information is credible and reported their intentions accordingly (Cacioppo & Petty, 1984). Further investigating the effects of information processing is an attractive approach to additionally assess the variables of interest.

Additional concern exists over the instrumentation of the study. For instance, the need for cognition items were limited in reliability and it is thus suggested that future studies utilize all 18 or 34 items of the need for cognition scale. It is also recommended that future studies utilize additional items for the empowerment, SESE, and information overload scales. Furthermore, social desirability may also have influenced responses on
items such as those measuring participants’ number of sexual partners and if whether participants or their partners have an STD.

While the current study is somewhat limited in its ecological validity, the study serves as an introduction into the relationships among subjective empowerment self-efficacy, information amount, and behavioral intention. A more thorough understanding of the nature of the aforementioned relationships may provide fruitful recommendations for health care providers and patients so that both parties can mutually benefit from the medical consultation.
References


Friedman, A. L., & Shepeard, H. (2007). Exploring the knowledge, attitudes, beliefs, and communication preferences of the general public regarding HPV: Findings from


Appendix A: Low Information Condition Message

Potentially Dangerous HPV Infections Can be Prevented by Gardasil Vaccine

HPV infections are common, potentially dangerous, and easily spread. A new vaccine can prevent many such infections.

The human papillomavirus (HPV) is a common sexually transmitted infection (STI) that affects between 50-75% of sexually active men and women, according to the American Cancer Society (ACS). HPV is most common in individuals in their late teens and early 20s.

There are many types of HPV—a few types may cause various cancers and/or genital warts in men and women. According to the ACS, HPV is the leading cause of cervical cancer in women. Infections may be present without symptoms but may go away over time without treatment. Risk factors for HPV infection include greater numbers of sex partners, the initiation of sex at an early age, vulnerable immune systems, and sex partners who have had multiple partners.

There is no cure for HPV, but a vaccine, Gardasil, is highly effective in preventing the types of HPV that cause 70% of cervical cancer and 90% of genital warts cases. A similar vaccine is expected to soon be approved for males. These vaccines are a safe way to reduce HPV related cancers for males and females.

Gardasil is given in three doses over a six-month period and costs a total of $375. Merck, the manufacture of Gardasil, reports that various side effects may occur. The
long-term effectiveness of the vaccine is not yet known. To determine if the vaccine is right for you, talk to a doctor or other healthcare professional.
Appendix B: Moderate Information Condition Message

Potentially Dangerous HPV Infections Can be Prevented by Gardasil Vaccine

HPV infections are common, potentially dangerous, and easily spread. A new vaccine can prevent many such infections.

The human papillomavirus (HPV) is a sexually transmitted infection (STI) that is very easily spread from person to person. It affects both men and women and can be present without any symptoms or signs. The Centers for Disease Control and Prevention (CDC) claims that condoms do not fully protect from HPV infection.

The American Cancer Society (ACS) reports that 50-75% of sexually active adults will be infected at some point in their lives. According to the ACS, HPV infection is most common in individuals in their late teens and early 20s—especially among college students.

Many people who have HPV may not know it. HPV may go away on its own without causing any health issues. If the virus persists, it may lead to cancer or genital warts according to WebMD. While there are many types of HPV, four types—types 6, 11, 16, and 18—can cause 70% of cervical cancer cases and 90% of genital warts cases.

The CDC describes genital warts as growths on the genital mucosa. Genital warts usually grow on the external genitalia. Warts can also grow on internal areas of the genital region and the mouth. Genital warts can be painful or irritable. The CDC claims that treatment for warts may be uncomfortable and very painful.
The ACS reports that in 2007 about 11,000 new cases of cervical cancer were diagnosed and over 3,000 women died from it in the United States. The ACS describes that HPV can cause additional cancers in men and women including anal, rectal, scrotal, penile, vaginal, and some head and neck cancers.

There is currently no cure for HPV. However, a vaccine can prevent the four types of HPV that cause 70% of cervical cancer and 90% of genital warts cases. The CDC claims that the vaccine, Gardasil, has the potential to save millions of women as cervical cancer leads to an estimated 233,000 deaths a year worldwide.

A similar vaccine is soon expected to be approved for males. Collectively, these vaccines can save more lives due to HPV related cancers as well as reduce the need for uncomfortable genital warts treatments for males and females.

While Gardasil is recommended prior to the onset of sexual activity, the vaccine may still be given to females who are sexually active. After much testing, the vaccine has been licensed as safe. The FDA and CDC continue to monitor the safety of the vaccine with the health of the public as a priority.

According to Merck, the manufacture of Gardasil, only six percent of side effects reported for the HPV vaccine were considered serious (about half of the average number for other vaccines). Gardasil is not a live virus—thus it is not possible to receive HPV from the vaccine. According to the FDA, the benefits of the HPV vaccine continue to outweigh the risks.

The HPV vaccine is new and may yield some negative results. Merck reports that common side effects include itching, redness, and/or pain at the injection site, fever,
nausea, and dizziness. Rare side effects reported by Merck may include fainting, allergic reactions, and even temporary paralysis.

According to the FDA, the vaccine is given in three doses over a six-month period and costs a total of $375. Not all insurance providers will cover the vaccine and financial assistance for the uninsured differs dramatically across states.

The long-term effectiveness of the vaccine is not yet known and thus the vaccine should be given with caution. The vaccine is less effective in protecting women who have already been exposed to one or more types of HPV. The HPV vaccine may not be right for everyone. To determine if the vaccine is right for you, talk to a doctor or other healthcare professional.
Appendix C: High Information Condition Message

Potentially Dangerous HPV Infections Can be Prevented by Gardasil Vaccine

HPV infections are common, potentially dangerous, and easily spread. A new vaccine can prevent many such infections.

The human papillomavirus (HPV) is a sexually transmitted virus that is easily spread. The Centers for Disease Control and Prevention (CDC) reports that over six million new cases of HPV occur every year. Nearly 20 million individuals currently hold HPV infections. The American Cancer Society (ACS) reports that 50-75% of sexually active adults will be infected at some point in their lives.

According to the ACS, HPV infection is most common in individuals in their late teens and early 20s—especially among college students. It affects both men and women and can be present without any symptoms or signs. The virus is spread through skin-to-skin contact rather than bodily fluids. The CDC claims that condoms do not fully protect from HPV infection.

The ACS says that HPV is not a new virus. However, many people have never heard of the virus. According to the American Social Health Association (AHSA), confusion and misinformation surround HPV and its issues.

Many people unaware of HPV are at risk themselves for infection. The AHSA says that HPV infection can affect anyone, regardless of sexual orientation.
The ASHA says that while some may think HPV occurs only among those having casual sex, even those in monogamous relationships are at risk. The AHSA adds that in monogamous relationships, an HPV diagnosis does not mean one is cheating. HPV infection can occur long before it is detected. The ASHA says that the virus can last a lifetime in the body without ever being detected.

WebMD experts say that HPV infection can be detected visually (appearance of warts) or through abnormal cell changes found during a Pap test. The American College of Obstetricians and Gynecologists (ACOG) recommends that women begin having routine Pap tests at the age of 21, or three years after first having sex.

While a Pap test can determine if there are abnormal cell changes, an HPV test can determine the virus that causes those changes, according to Planned Parenthood. WebMD says that the HPV test is only necessary for women over the age of 30. The HPV test should be used in addition to the Pap test rather than replacing it. The National Cancer Institute (NCI) says that even with testing, physicians may not be able to detect the time at which infection occurred. The ASHA says that it is nearly impossible for testing instruments to track the virus back to a particular person.

Although HPV is common, several factors make individuals more likely to contract the virus. According to the Mayo Clinic, greater numbers of sex partners, young age, and vulnerable immune systems are risk factors. Other factors include the initiation of sex at an early age, and sex partners who have had multiple partners. Cigarette smoking and alcohol consumption have been shown to help promote the invasion of HPV. NCI says that cigarette smoking and having many children may increase the risk of cervical cancer among women with HPV.
HPV may go away on its own without causing any health issues in 8 to 13 months, according to Planned Parenthood. If the virus persists, it may lead to cancer or genital warts for the 45% of individuals who cannot build immunity, according to WebMD. There are numerous types of HPV, 40 of which affect the genital area. Of those 40 types, four types—types 6, 11, 16, and 18—can cause 70% of cervical cancer cases and 90% of genital warts cases.

The CDC describes genital warts as growths on the genital mucosa. Genital warts usually grow on the external genitalia. Warts can also grow on internal areas of the genital region and the mouth. Genital warts can be extremely irritable. The CDC says that treatment for warts may be uncomfortable and very painful.

According to the CDC, the virus may stay in the body even after treatment for genital warts. It is possible to pass the virus when there are no warts present. The ASHA says that only 1% of sexually active Americans have visible warts at any given time.

The ACS reports that in 2007 about 11,000 new cases of cervical cancer were diagnosed and over 3,000 women died from it in the United States. According to the ACS, HPV can cause additional cancers in men and women including anal, rectal, scrotal, penile, vaginal, and some head and neck cancers.

According to the ASHA, cervical cancer usually takes between 10 to 20 years to develop. Even years after sexual activity, this cancer can continue to develop. It is important for women to have Pap tests throughout life. Cervical cancer is completely preventable when detected early, as said by the ASHA.

According to NCI, the only way to prevent HPV is to abstain from genital contact with others. For those who are sexually active, a mutually monogamous relationship with
an uninfected person is most likely to prevent infection. The CDC says that urinating, washing the genitals, and douching do not protect from HPV infection.

There is currently no cure for HPV. However, a vaccine can prevent the four types of HPV that cause 70% of cervical cancer and 90% of genital warts cases. The CDC claims that the vaccine, Gardasil, has the potential to save millions of women as cervical cancer leads to an estimated 233,000 deaths a year worldwide. According to the CDC, Gardasil is currently the only vaccine that protects against cervical cancer.

The Food and Drug Administration (FDA) says that once approved for males, a similar vaccine may have the potential to save the lives of many men by preventing related cancers. The HPV vaccine can also save men and women from the embarrassment and uncomfortable treatments associated with genital warts.

Before it was approved by the FDA in 2006, the vaccine was studied in thousands of girls and women between the ages of 9 and 26. The ACOG recommends routine HPV vaccination for girls aged 11 to 12 years. While the vaccine is recommended prior to the onset of sexual activity, the vaccine may still be given to females who are sexually active.

After much testing, the vaccine has been licensed as safe. The FDA and CDC continue to monitor the safety of the vaccine with the health of the public as a priority.

Merck, the manufacturer of Gardasil, says that the vaccine mimics the disease and creates resistance—it is NOT a live or a dead virus. Thus, it is not possible to get HPV from the vaccine itself.

According to Merck, only six percent of side effects reported for the HPV vaccine were considered serious (about half of the average number for other vaccines). The
vaccine is a safe and effective way to prevent future HPV diseases. The FDA says that the benefits of the HPV vaccine continue to outweigh the risks.

The HPV vaccine is new and may yield some negative results. Merck reports that common side effects include itching and/or pain at the injection site, fever, nausea, and dizziness. Rare side effects reported by Merck may include fainting, allergic reactions, and even temporary paralysis.

According to the FDA, the vaccine is given in three doses over six months and costs about $375. Not all insurance providers cover the vaccine. Financial assistance for the uninsured differs dramatically across states.

Although the vaccine is highly effective in protecting against cervical cancer, NCI says that routine Pap tests are still necessary. The vaccine protects against 70% of cervical cancer cases; however, 30% of cervical cancers may not be prevented from vaccination. The vaccine also does not protect from about 10% of genital warts cases. It is highly recommended by the NCI that even after vaccination, individuals use condoms or other such forms of protection when engaging in sexual activity.

The long-term effectiveness of the vaccine is not yet known and thus the vaccine should be given with caution. The vaccine is less effective in protecting women who have already been exposed to one or more types of HPV. The vaccine may not be right for everyone. To determine if the vaccine is right for you, talk to a doctor or other healthcare professional.


## Appendix D: Empowerment Scale Items

<table>
<thead>
<tr>
<th>Item on Questionnaire</th>
<th>Chronbach’s $\alpha = .566$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My health decisions are mine, not the doctor’s.</td>
<td></td>
</tr>
<tr>
<td>2. I feel pressured into choosing the decision that my doctor suggests.</td>
<td></td>
</tr>
<tr>
<td>3. My doctor describes all of my options and lets me choose what to do.</td>
<td></td>
</tr>
<tr>
<td>4. My doctor supports my health decisions even if he or she disagrees.</td>
<td></td>
</tr>
<tr>
<td>5. I am satisfied with the contribution I make to decisions about my health</td>
<td></td>
</tr>
</tbody>
</table>

*Survey items use a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). Items were reverse coded for analyses.*
Appendix E: Information Overload Scale Items

<table>
<thead>
<tr>
<th>Item on Questionnaire</th>
<th>Chronbach’s α = .664</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The information was easy to process.</td>
<td></td>
</tr>
<tr>
<td>2. The information helped me make a decision whether or not to be vaccinated for HPV.</td>
<td></td>
</tr>
<tr>
<td>3. The information was confusing.</td>
<td></td>
</tr>
<tr>
<td>4. I would need more information about the vaccine before I make any decision.</td>
<td></td>
</tr>
</tbody>
</table>

*Survey items use a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). Items were reverse coded for analyses. *A fifth item asking participants to rate the information on a 9-point scale where 1 = “opposing vaccination” and 9 = “supporting vaccination” was dropped from analyses as it did not relate to the operationalization of information overload.
Appendix F: Need for Cognition Scale Items

<table>
<thead>
<tr>
<th>Item on Questionnaire</th>
<th>Chronbach’s α = .540</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I really enjoy a task that involves coming up with new solutions to problems.</td>
<td></td>
</tr>
<tr>
<td>2. I believe that if I think hard enough, I will be able to achieve my goals in life.</td>
<td></td>
</tr>
<tr>
<td>3. I am very optimistic about my mental abilities.</td>
<td></td>
</tr>
<tr>
<td>4. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.</td>
<td></td>
</tr>
<tr>
<td>5. I tend to set goals than can be accomplished by spending the least amount of mental effort.</td>
<td></td>
</tr>
<tr>
<td>6. When something I read confuses me, I just put it down and forget it.</td>
<td></td>
</tr>
<tr>
<td>7. I take pride in the products of my reasoning.</td>
<td></td>
</tr>
<tr>
<td>8. I usually don’t think about problems that others have found to be difficult.</td>
<td></td>
</tr>
</tbody>
</table>

*Survey items use a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). Items were reverse coded for analyses.
Appendix G: Subjective Empowerment Self-Efficacy (SESE) Scale Items

<table>
<thead>
<tr>
<th>Item on Questionnaire</th>
<th>Chronbach’s α = .850</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How confident are you that you can ask your physician about the HPV vaccine at your next appointment?</td>
<td></td>
</tr>
<tr>
<td>2. How confident are you in your ability to have a discussion with your physician about the pros and cons of HPV vaccination at your next appointment?</td>
<td></td>
</tr>
<tr>
<td>3. How confident are you in your ability to make a decision regarding HPV vaccination based on what you know now about HPV and the vaccine?</td>
<td></td>
</tr>
<tr>
<td>4. How confident do you feel that you would go get a second opinion if you do not agree with your physician’s recommendation?</td>
<td></td>
</tr>
</tbody>
</table>

*Survey items use a 7-point scale (1 = “not at all confident;” 5 = “extremely confident”).
Appendix H: Behavioral Intention Items

<table>
<thead>
<tr>
<th>Item on Questionnaire</th>
<th>Chronbach’s $\alpha = .760$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The next time I visit my physician, I intend to ask about the HPV vaccine.</td>
<td></td>
</tr>
<tr>
<td>2. I have decided whether or not I intend to get vaccinated.</td>
<td></td>
</tr>
<tr>
<td>3. I intend to get vaccinated for HPV.</td>
<td></td>
</tr>
<tr>
<td>4. I intend to get more information about the HPV vaccine in order to decide if I</td>
<td></td>
</tr>
<tr>
<td>should be vaccinated.</td>
<td></td>
</tr>
<tr>
<td>5. I intend to talk to my friends about the HPV vaccine.</td>
<td></td>
</tr>
<tr>
<td>6. I intend to talk to my family about the HPV vaccine.</td>
<td></td>
</tr>
</tbody>
</table>

*Survey items use a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). Items were reverse coded for analyses.*
Appendix I: SESE Scores by Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information</td>
<td>5.159</td>
<td>1.338</td>
</tr>
<tr>
<td>Low information amount</td>
<td>5.729</td>
<td>1.378</td>
</tr>
<tr>
<td>Moderate information amount</td>
<td>4.971</td>
<td>1.805</td>
</tr>
<tr>
<td>High information amount</td>
<td>5.603</td>
<td>1.370</td>
</tr>
</tbody>
</table>