

Risk Information Seeking and Processing About HPV Among Chinese Female Students in the United States

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RISK INFORMATION SEEKING AND PROCESSING ABOUT HPV AMONG CHINESE FEMALE
STUDENTS IN THE UNITED STATES

by
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ABSTRACT
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Shiyao Li, B.A

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The present study aims to examine the information seeking and processing behaviors about Human Papillomaviruses (HPVs) among Chinese female college students in the United States. HPV is the most prevalent sexually transmitted virus in the United States and all around the world. It is closely associated with cervical cancer, which is a major cause of death among women in developing countries. However, knowledge of the virus among women worldwide remains at low level despite of its severity and prevalence. Due to the fact that HPV vaccine is still going under clinical trials in China, the Chinese student body in the United States represents a huge market for HPV vaccination. The present study utilizes the model of Risk Information Seeking and Processing (RISP) to investigate the factors that motivate these students to seek and process information about HPV. The results indicated significant relationships of information insufficiency to information seeking, avoidance, systematic processing, and heuristic processing. Perceived gathering capacity was found related with all of the information seeking/processing variables. The study also found a moderate level of knowledge about HPV among Chinese female international students in the U.S. Other sociological and cognitive factors influencing the informational behaviors of Chinese students have also been identified.

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I. INTRODUCTION

Human Papillomavirus (HPV) is a sexually transmitted virus that may cause various types of pathologies, including genital or skin warts and certain types of cancers (Greenblatt, 2005). Conclusive evidence has been established by clinical research for the role of high-risk types of HPVs (HPV 16 & HPV 18) in the etiology of cervical cancer (Marlow, Waller, & Wardle, 2007). As the main etiological factors for causing cervical cancer (Szaboova, Svlhrova, & Hudeckova, 2014), HPV 16 and HPV 18 are believed to account for around 70% of the cases of the cancer (Boshart et al., 1984), which remains a major cause of death in developing countries (Greenblatt, 2005). However, most cases of HPV infections produce minor or no symptoms and those who are infected often unknowingly transmit the virus to their sexual partners (Vanslyke, et al., 2008). Eighty percent to Eighty-five percent of sexually active adults are expected to be infected by the virus at least once during their lifetime (Muñoz, Castellsague, de Gonzalez, & Gissmann, 2006). With such prevalence among sexually active population, HPV is believed to be the most common sexually transmitted virus in the United States (Centers for Disease Control, 2015a) and all around the world (Fey & Beal, 2004).

Public Knowledge about HPV and HPV Vaccination

Despite its severity and prevalence, public knowledge about the virus remained at low level until nearly a decade ago when HPV vaccine was licensed and introduced into the medicine market (Vanslyke, et al., 2008). According to Vanslyke

et al., the pharmaceutical company's start of media campaigns about the links between HPV and cervical cancer is what made HPV visible to the public. Since its introduction to the public, prophylactic vaccination of HPV has been proved highly effective in preventing HPV infections (Marlow, Waller, & Wardle, 2007), including the types of infection which cause genital warts and the high-risk types which are directly related to cervical cancer (Vanslyke, et al., 2008). The vaccine is proved to be high effective and long-lasting. Current research have traced the vaccine for ten years and no effect reduction is shown among women who have been vaccinated (Centers for Disease Control, 2015b). As a result, HPV vaccination has become an effective way to prevent cervical cancer and reduce the required frequency of cervical screening (Marlow, Waller, & Wardle, 2007). Thus, the Centers for Disease Control (CDC) recommends HPV vaccination for individuals who are not sexually active beginning at age nine, and for individuals under the age of twenty-six who have already been engaged in sexual activities.

Because of the important influence of HPV on human health, an extensive number of studies have been done worldwide on individuals' knowledge and perception of HPV infection, HPV vaccination, and prevention of cervical cancer. In studies done in developing areas, a large number of women show only limited knowledge of the virus, its link to cervical cancer, and prevention methods. Wong (2011) constructed a study measuring women's knowledge of HPV and attitude towards the vaccination in rural Malaysia. The results indicate the extremely limited amount of knowledge these women possess: only 11.6% of the women surveyed had heard of HPV. Tang et al. (2014) surveyed 848 high school students in the

Xiangtan City of Hunan Province in China regarding the same topic. Only 10.1% of the surveyed population had heard of HPV, and out of these respondents, only 18.6% indicated that they were aware of the association between the virus and cervical cancer. Studies also found that, in developed countries, there is a racial disparity between whites and minorities regarding the topic (see, for example, Cates, et al., 2009). The study conducted by Cates and her colleagues found that African American women hold more reluctant attitudes towards HPV vaccination due to their relatively lower level of knowledge. In Australia, where government is funding HPV vaccination program, a high level of awareness is reported: 51.2% of the women in Victoria have heard of HPV (Pitts, Dyson, Rosenthal, & Garland, 2007).

HPV, Cervical Cancer, and HPV Vaccination in China

As the most prevalent sexually transmitted virus worldwide (Fey & Beal, 2004), the incidence of HPV is even higher in developing countries than in developed countries (Winer, Hughes, Feng, Xi, Lee, O'Reilly, Kiviat, & Koutsky, 2012). Cervical cancer, more than 70% of which is caused by HPV, kills more than 275,000 women annually (Hong, Zhang, Li, Lin, & Liu, 2013). Eighty percent of cervical cancer cases occur in developing countries; in China, the most populous country in the world, approximately 40,000 women die from cervical cancer each year (Hong et al., 2013). However, the incidence rate of cervical cancer among Chinese younger females has been on the rise since the late nineteen-eighties. From 1988-1992, the incidence rate of cervical cancer among females aged 20-24 is .21/100,000. That number became 1.35/100,000 from 1998-2002 (Hong et al., 2013).

Despite the heavy burden that cervical cancer has brought to Chinese society, efforts to prevent the disease seem to have been inadequate. For example, no nationwide cervical screening program has been established, and free screening is available only to the women in a few rural areas (Zhang et al., 2013).

As the most effective way to prevent cervical cancer, HPV vaccine had become available in Hong Kong a year after it was licensed. Nonetheless, the vaccine is still undergoing clinical trials in Mainland China, and has not yet been approved by the State Food and Drug Administration. In the study conducted by Zhang and her colleagues (2013), the researchers found that only 30% of the parents of adolescent girls showed acceptance of the vaccine. A positive correlation between knowledge of the virus and acceptance of the vaccine has also been found. In spite of the inadequate prevention methods available against HPV and cervical cancer in China, Chinese students who come to universities in the United States do have the opportunity to receive HPV vaccination. As at Marquette University, the vaccination fee is covered by international students' health insurance. The Chinese student body represents a huge potential market for HPV vaccination, and thus it is important to investigate their informational behaviors when it comes to HPV. No studies were found regarding information seeking and processing about this topic among Chinese female students in the U.S. The author expects the present study to help health agencies better inform Chinese students about the virus and the vaccine, and better construct health campaigns for this population.

Information Seeking About HPV

Few studies have been done to examine individuals' information seeking behaviors towards HPV, HPV vaccination and cervical cancer. Wong (2014) conducted a survey study utilizing the Theory of Motivated Information Management to find predictors of young women's intentions to seek HPV information. The study locates three significant predictors of information seeking intentions among the surveyed women: positive outcome expectancy, anxiety about the uncertainty of the vaccine, and HPV risk perception. Information seeking intentions also predict these women's willingness to take HPV vaccination. Hang-In et al. (2009) explored information-seeking intentions, information needs, and information sources among South Korea women with cervical cancer. This study determines that there is a socioeconomic disparity among cervical cancer patients in terms of their information seeking behaviors. Patients who are younger, with higher educational level and higher income are more likely than other patients to seek out information about their disease.

Bynum and her colleagues (Bynum, Malo, Lee, Guiliano, & Vadaparampil, 2011) examined information seeking about HPV among U.S physicians. This study focuses on the information-seeking channels physicians use to acquire information about HPV and provide the information to their patients. The results indicate that most physicians (50%) obtain information about HPV vaccination from professional organizations. The other major sources of information for U.S physicians include the Advisory Council on Immunization Practices (ACIP), medical conferences, and colleagues.

II. Theoretical Overview

The Model of Risk Information Seeking and Processing

To further understand the factors that motivate individuals to seek and process risk information, the theoretical framework that will be used in this study is the Model of Risk Information Seeking and Processing (RISP, see figure 1) developed by Griffin, Dunwoody, and Neuwirth (1999). This model aims to unravel the social, psychological and communicative factors that prompt information seeking and processing behaviors, and is one of the most comprehensive models in the field of risk-information-seeking research (Yang, Aloe, & Feeley, 2014).

In an effort to understand how each individual responds to health risk messages, RISP adopts two key theories from the larger fields of information processing research and of behavioral research (Griffin, Dunwoody, & Neuwirth, 1999): Eagly and Chaiken's (1993) Heuristic-Systematic Model (HSM) of information processing (HSM), and Ajzen's Theory of Planned Behavior (TPB) (Ajzen, 1988). These two theories contribute to different aspects of the RISP model: HSM focuses on how individuals seek and process the information about a given risk, while TPB helps in understanding how the seeking and processing behaviors link eventually with preventive actions towards the specific risk (Griffin, Dunwoody, & Neuwirth, 1999). The main principle which forms the basis of the operation of RISP is the sufficiency principle that comes from HSM (Lu, 2014). The sufficiency principle argues that individuals will exert just the amount of information processing effort they require in order to reach a level of sufficient confidence that

their judgments (e.g., beliefs and attitudes) are consistent with reality. In HSM, this is termed the "accuracy motivation" for information processing. HSM also suggests that, when the desired sufficiency threshold is attained (what is known as "satisficing"), individuals will stop their processing efforts (Eagly & Chaiken, 1993). The RISP model largely adopts this principle and asserts that *information insufficiency* is a major part of what motivates individuals to engage in various kinds of risk information seeking and processing activities that may be more or less effortful (Griffin, Dunwoody, & Neuwirth, 1999).

Since its debut in the realm of risk communication, the RISP model has been repeatedly tested and has guided over a dozen researches in this field (Yang, Aloe, & Feeley, 2014). The risky settings tested are often closely related to the personal safety and health of each individual, but "impersonal" risks (e.g., to the natural environment or to others) have also been the focus of RISP research. For example, in the late 1990s, Griffin and his colleagues conducted a series of panel-design studies in two Great Lakes cities, Milwaukee and Cleveland, to examine residents' information seeking behaviors when it comes to eating contaminated fish and drinking contaminated water from the lakes, and ecological risks to the Great Lakes (Griffin, Neuwirth, Dunwoody, & Giese, 2004). Yang and her colleagues conducted several studies on information seeking and processing behaviors related to clinical trial enrollment (Yang, et al., 2010a; Yang, et al., 2010b; Yang, et al., 2011). Informational behaviors related to severe risks such as river flooding and long-term impersonal risks such as energy issues were also examined by RISP researchers (Griffin, et al., 2008; Griffin, et al., 2005).

Over the past decade and a half, during which the model has been extensively tested, various researchers have also been putting an effort into augmenting and amending the model to improve its explanation of human information seeking and processing behaviors. The works of several researchers have contributed to the development of the RISP model as well as the field of information seeking research. Kahlor (2007) proposed an augmented model of information seeking and processing using survey research on individuals' perception of global warming. Basing on her augmented version of the model and several other key theories from the literature, Kahlor (2010) proposed the Planned Risk Information Seeking Model (PRISM) (2010), which emphasizes information seeking as a planned behavior. The model links key variables from TPB and RISP together and accounts for 59% of the variance in health-information-seeking intent (Lu, 2014). However, PRISM does not include consideration of individuals' beliefs about the credibility, usefulness, and outcomes for themselves of relying on various channels of risk information ("relevant channel beliefs"), one of the main variables in the RISP model that would yield useful information to those planning risk communication campaigns, nor does PRISM include information processing behaviors, which, according to Griffin, Dunwoody, & Neuwirth (1999), are key factors in individuals' learning about a risk.

Griffin, Dunwoody, & Yang (2012) also proposed an amended RISP in an effort to give a more comprehensive look at human informational behaviors (See figure 2). The amended model is based on extensive examination of the studies that have utilized the original model and introduces new variables into the interplay of risk information seeking and processing. The revised version of RISP model also

amends the operationalization of several interactions between variables in the original version.

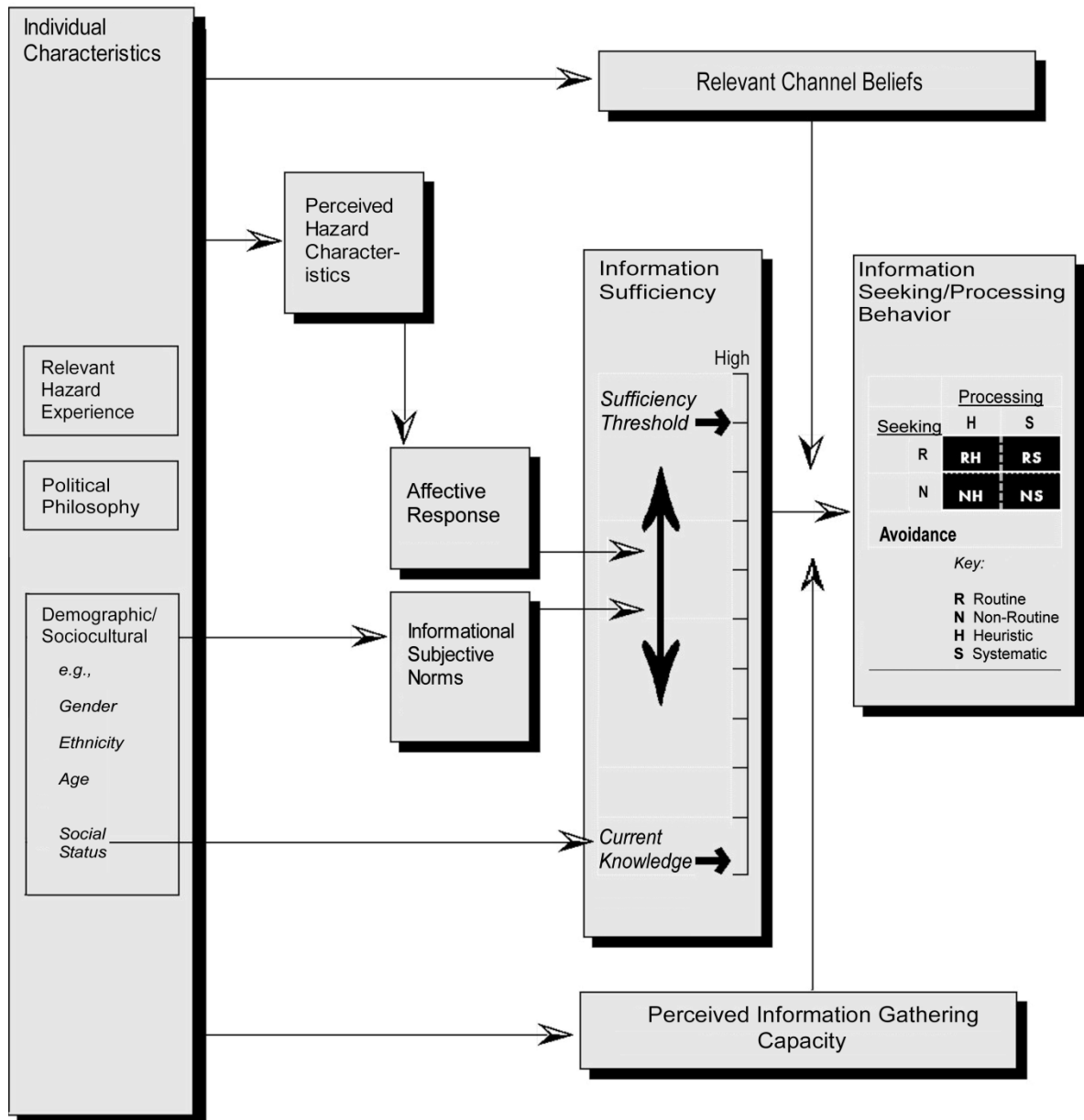


Figure 1. The Model of Risk Information Seeking and Processing (Griffin, Dunwoody, & Neuwirth, 1999)

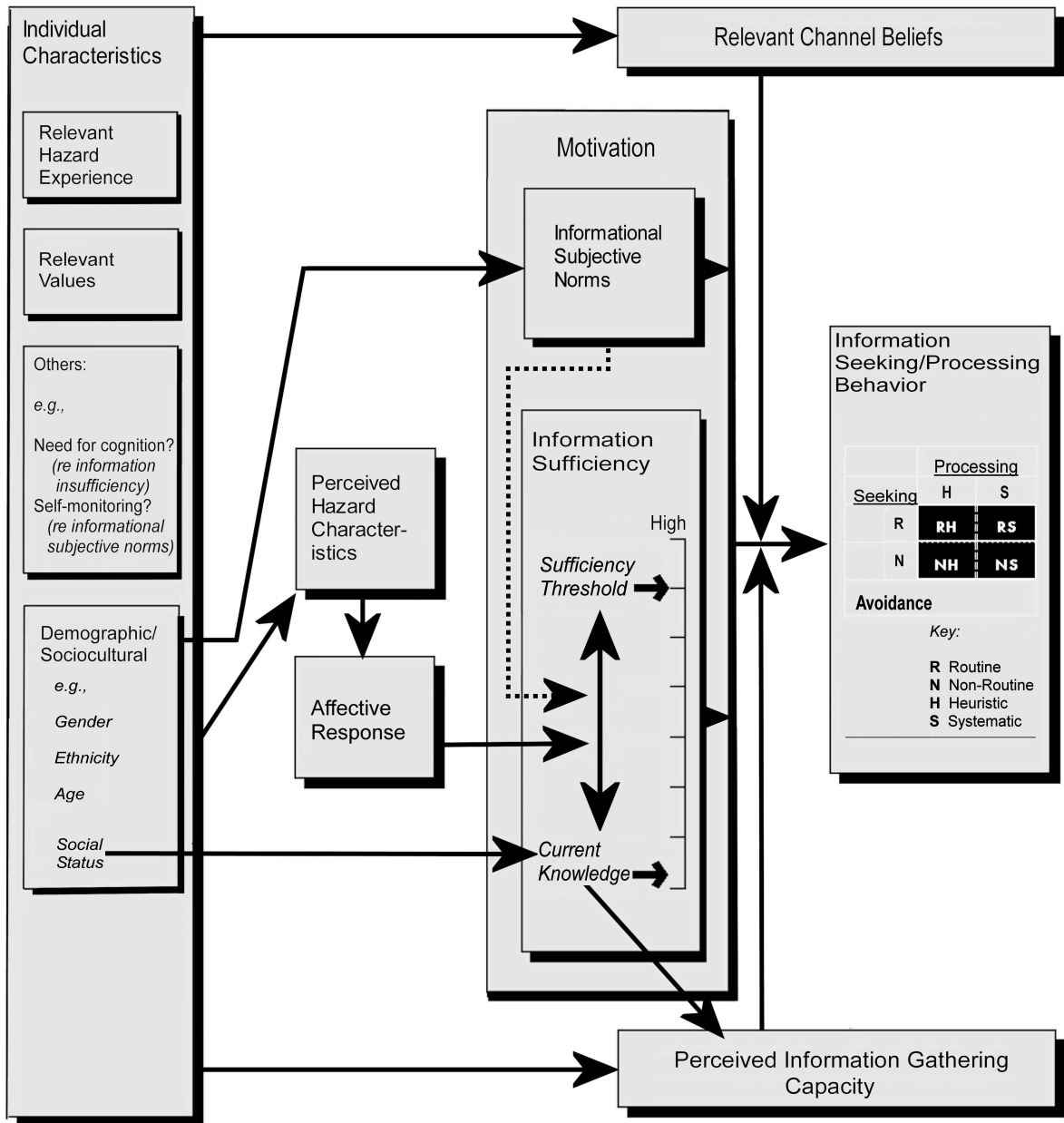


Figure 2. Amended RISP Model (Griffin, Dunwoody, & Yang, 2012)

Information Seeking and Processing

The key dependent variables in the RISP model are information seeking and information processing, which locate at the far right side of the model. Risk

information seeking represents “the extent to which a person will actively seek out risk information in both routine and nonroutine channels” (Griffin, Dunwoody, & Neuwirth, 1999, p. S232). Information processing represents “the extent to which he or she will spend time and effort analyzing the risk information critically” (Griffin, Dunwoody, & Neuwirth, 1999, p. S232).

Information processing in the RISP model adopts the critical concept of heuristic-systematic information processing from HSM. Heuristic processing represents a more superficial way to process information. When an individual uses this kind of processing to make judgments about a certain piece of information, the person largely relies on heuristics based in superficial or uncritical assumptions, existing knowledge and general rules (e.g., a belief based on past experience such as “longer stories are more believable” or “this source is an authority”). Systematic processing, on the other hand, requires deeper cognition, critical thinking, and more intensive effort (Griffin, Dunwoody, & Neuwirth, 1999). When an individual uses systematic processing to make judgments, a relatively large amount of cognitive effort will be used in order to critically evaluate the information and to understand it comprehensively. More attention is paid to the quality of information and the arguments presented rather than to the established power or authority of the source. Systematic processing also leads to more stable attitudes based on the information (Eagly & Chaiken, 1993), which can translate into more stable (less volatile or changeable) behavioral beliefs, attitudes toward the behavior, behavioral intentions, and behaviors, as depicted in TPB (Griffin, Dunwoody, & Neuwirth, 1999). The developers of the RISP model expect that “people who engage in more

effortful information seeking and processing are more likely to develop risk-related cognitions, attitudes and behaviors that are more stable over time. Since most forms of health information campaigns attempt to get people to adopt habitual or lifestyle changes, factors leading to the stability or volatility of those behavioral changes are essential concerns (Griffin, Dunwoody, & Neuwirth, 1999, p. S230).

In an effort to put linkages between information seeking and processing behaviors, the RISP model includes four distinctive combinations of seeking and processing. These combinations include: 1) Routine/Heuristic -- individuals heuristically processing information using what, for them, are routinely accessed media channels; 2) Routine/Systematic -- individuals systematically processing information using routine media channels; 3) Nonroutine/Heuristic: individuals processing information heuristically using media channels they do not usually use; and 4) Nonroutine/Systematic -- individuals processing information systematically using media channels they do not usually use.

Information Insufficiency, Information Subjective Norms, Perceived Information Gathering Capacity, and Relevant Channel Beliefs

Next to *Information Seeking & Processing* (see Figure 2) are three factors which exert direct or indirect (e.g., interactive) influences on the dependent variables: 1) motivation (which includes information insufficiency and informational subjective norms), 2) perceived information gathering capacity, and 3) relevant channel beliefs.

Sufficiency principle is a major concept in HSM, under which an individual's choice of heuristic or systematic processing operates. The principle indicates that the gap between current knowledge about an issue and the desired degree of information sufficiency influences individuals' choice of processing effort and styles. The RISP model tailors the principle in order for it to better predict informational behaviors in risky settings. The model indicates that different levels of confidence will be needed by individuals according to the personal salience of a specific risk (Griffin et al., 2004). Varying levels of information insufficiency motivate people to passively or actively seek out information about the risk, and to heuristically or systematically process the information to make decisions about the risk, as noted in Figure 3. Greater insufficiency motivates more effortful seeking and processing.

Informational subjective norms is a variable proposed by the RISP model that directly exert an influence on information insufficiency. Informational subjective norms (ISN) represent the social normative influence gained from relevant others (Griffin, Dunwoody, & Neuwirth, 1999). The model proposes that a person's perceptions of important others' knowledge about a risk and the others' expectations about keeping abreast of that knowledge motivate the person's own desire to seek out information about the risk and to systematically process it. Two types of ISN are identified according to the different aspects they emphasize: injunctive ISN represents the individual's beliefs about what relevant others expect him or her to do (e.g., a person might believe that "most people who are important to me think that I should keep on top of information about this risk"), and descriptive ISN represents the beliefs about what relevant others do themselves

(e.g., "most people who are important to me [*alternatively, who are like me*] keep on top of information about this risk"). While in the original RISP model, ISN exerts directly on information sufficiency, and information sufficiency in turn influences information seeking and processing; in the amended model, ISN is redefined as capable of directly affecting information seeking and processing behaviors, as shown in Figure 2 (Griffin, Dunwoody, & Yang, 2012).

Perceived information gathering capacity in the RISP model represents one's self-efficacy in obtaining and processing the information they need. The researchers believe that the ability to perform information seeking and processing steps exerts a facilitating effect on people's motivation to do so (Griffin, Dunwoody, & Neuwirth, 1999). The higher the perceived ability is, the more readily a motivated individual might seek out information and put more cognitive effort into processing the information they gain.

Relevant channel beliefs are the attitudes each individuals hold towards the trustworthiness and usefulness of the channels of risk information (Griffin, Dunwoody, & Neuwirth, 1999). The RISP model suggests that these beliefs influence individuals' behaviors of information seeking and processing. The rationale is rooted in Kosicki and Mcleod's (1990) study on mass media audiences. In this study, those researchers found that people held different attitudes towards mass media, and these so-called media images were influenced by several social and political factors. The different attitudes held by the audiences eventually affected their processing strategies about the information they gained from these media. The discussion of the amended RISP model believes that channel beliefs are similar to

the behavioral beliefs in TPB, that is, expectations that individuals have about the outcomes for themselves of using different channels for risk related information. Relevant channel beliefs is one of the variables excluded from the PRISM (Kahlor, 2007) adaptation of RISP.

Affective Response

Affective response is the emotional reaction towards a risk. The RISP model posits a linkage between affective response and information insufficiency. Research has indicated that negative emotions (e.g., worry, anger) are associated with systematic processing, while positive emotions (e.g., hope, elation) are related to heuristic processing (Griffin, Dunwoody, & Neuwirth, 1999). Previous RISP research has also demonstrated that negative emotions, such as worry and fear, are positively related to information insufficiency (See, for example, Griffin et al., 2008).

Perceived Hazard Characteristics

Perceived hazard characteristics indirectly influence the information seeking and processing behaviors of a risk. In the RISP model, perceived hazard characteristics are depicted as multidimensional in accordance with the classic work of Gregory and Mendelsohn (1993). In their analysis, they concluded that six variables account for individuals' assessments of a perceived risk. The RISP model readjusts the six variables so they apply better to health risks, and redefines the variables as "perceptions of personal risk," "seriousness of the outcome for oneself," "immediacy of onset for oneself," and "benefits for the self" (Griffin, Dunwoody, &

Neuwirth, 1999, p. S235). Three other precursors are also added into the model: 1) self-efficacy, which represents individuals' personal control over the risk, 2) institutional trust, which represents the amount of trust an individual has in the ability of responsible agencies and institutions to prevent the risk from harming him or her, and 3) perceived threats to personal values (Griffin, Dunwoody, & Neuwirth, 1999). As the model has developed over the years, it has also been applied to impersonal (especially environmental) risks, thus producing some reorchestration of the main perceived hazard characteristics so that they apply to personal as well as impersonal risks: (1) perceived probability of harm to self, others, or the environment; (2) perceived seriousness of this outcome; (3) perceived self-efficacy or personal control over the risk, a form of internal locus of control; (4) trust in responsible agencies to prevent harm, a form of external locus of control, and (5) causal attributions for the risk and thus for mediation or protection responsibilities (Griffin, Dunwoody, & Yang, 2012). The variable "risk judgment" is derived by multiplying measures of perceived probability of harm times perceived seriousness of the outcome. In the RISP model, specifically, perceived hazard characteristics directly impact affective response.

Individual Characteristics

Individual characteristics influence information insufficiency through both direct and indirect paths in the RISP model, and information insufficiency, in turn, exerts an influence on information seeking and processing behaviors. The three main subsets in individual characteristics are demographic/sociocultural factors,

relevant hazard experience, and relevant values (e.g., political philosophy). Past research has indicated the impact of demographic characteristics, such as age, ethnicity, gender, and socioeconomic status, on individual's perception of risks. For example, in Vaughn and Nordenstam's study (1991), ethnicity is found to be a predictor of individuals' perceptions of environmental risks. The differences in risk perceptions between different ethnic groups may be caused by the differences in perceptions of personal control over the risk, and in levels of exposure to that risk. Age, as another important indicator, plays a role in human behaviors of information seeking and processing. Studies have found that one's risk judgments strengthen as one becomes older, but this relationship may change due to various risk characteristics (Griffin, Dunwoody, & Neuwirth, 1999). Relevant hazard experience has also been found as a strong predictor, as persons with a relevant hazard experience of a risk may transfer their fear of the risk to another risk (Johnson & Tversky, 1983).

Research Questions and Hypotheses

After a systematic review of the variables and interactions of the RISP model, research questions and hypotheses can be proposed using the RISP model as guidance.

Due to the relationship between information insufficiency and information seeking/processing behaviors proposed by the model, propositions about respondents' information insufficiency about HPV and their motivation to seek out information about HPV can be made. Thus, the first research question is:

RQ1: What are the relationships between information insufficiency and the seeking and processing of HPV risk information?

Specifically, it is hypothesized:

H1a: Information insufficiency will be positively related to active information seeking.

H1b: Information insufficiency will be negatively related to information avoidance.

The model also suggests that there is a positive relationship between information insufficiency and information processing, thus it is hypothesized:

H2a: Information insufficiency will be positively related to systematic information processing.

H2b: Information insufficiency will be negatively related to heuristic information processing.

Previous studies have indicated the positive relationship between informational subjective norms and information insufficiency. In the present study, since HPV infection is closely associated with physical health and well-being, the author assumes that respondents will take the information seeking and processing expectations and behaviors of relevant others into consideration. Thus, the second research question is:

RQ2: What are the relationships between informational subjective norms and information insufficiency, and the seeking and processing of HPV risk information?

Specifically, it is hypothesized:

H3a: Informational subjective norms will be positively related to information insufficiency.

In the amended RISP model, informational subjective norms are believed to also exert a direct influence on information seeking and processing, thus it is hypothesized:

H3b: Informational subjective norms will be positively related to active information seeking.

H3c: Informational subjective norms will be negatively related to information avoidance.

H3d: Informational subjective norms will be positively related to systematic information processing.

H3e: Informational subjective norms will be negatively related to heuristic information processing.

Affective response has been proved to relate to information insufficiency.

Thus, the third research question is:

RQ3: What is the relationship between affective response and information insufficiency?

Specifically, it is hypothesized:

H4: Negative emotions will be positively related to information insufficiency.

Based on the assumption that perceived hazard characteristics directly impact on affective response, the fourth research question is proposed as follows:

RQ4: What is the relationship between perceived hazard characteristics and affective response?

Specifically related to risk judgment, it is hypothesized:

H5a: Risk judgment will be positively related to negative affect.

Since self-efficacy is another important factor of perceived hazard characteristics, and based on the assumption above, it is hypothesized:

H5b: Self-efficacy will be negatively related to negative affect.

This study aims at females aging from 18-26 years old; thus there is an age gap of eight years from the youngest to the oldest respondent. A difference in risk perception caused by age difference can be expected. However, since the relationship between age and risk perception may vary according to the risk characteristic, instead of proposing a hypothesis, the author would like to ask a research question:

RQ5: What is the relationship between age and other variables in this study?

Since the knowledge about HPV among Chinese female students in the United States is unknown in the current literature, the author will also examine the knowledge level of HPV and related diseases among this group. Thus RQ6 is proposed as follows:

RQ6: What is the knowledge level of HPV, HPV vaccination, and cervical cancer among Chinese female students in the United States.

III. METHOD

The present study focuses mainly on examining the information seeking and processing behaviors among Chinese female college students studying in the United States. Secondly, this study aims to find out what sociological and cognitive factors exert an influence on the current knowledge level of HPV of this group of individuals. An online survey comprised of sixty-six questions was conducted through Qualtrics to determine the relationships between various RISP variables, as well as other variables and knowledge level variables.

Sampling

Due to time constraints and budget limits, it was not feasible to construct a probability sample of Chinese female college students in the United States, although that would have been preferred to better ensure representativeness and limit selection biases. Because of the lack of national and official organizations for Chinese students in the United States, this group of individuals was especially hard to reach. Instead, a convenience sample of 173 of these students was recruited from the universities at which the author had access to the students. Thus, a special recruiting method using an online instant messaging software "QQ" was utilized in the process of sampling.

QQ was developed in 1999 and is considered to be the most popular instant messaging software in China. The software features a multi-chatting function, "QQ group," which allows multiple users to exchange messages with each other. Since

there is no official Chinese student alliance in U.S, most U.S universities have a QQ group which is established by Chinese students who wish to share information with other Chinese students. Anyone with a registered QQ account can join any group and doing so does not violate the terms of using QQ. QQ users also have an associated QQ e-mail address, and if a person joins a QQ group, this person will be able to send group e-mails to all the members within the group. Thus, QQ was used to recruit female Chinese students in the United States.

After receiving the official approval from Institutional Review Board at Marquette University (protocol HR-2963), the author joined five QQ groups of U.S universities and a Chinese student group and used three methods to recruit the participants. First, the author used the instant messaging function and sent the link of the survey to all the members in the groups. Anyone who saw the link and was willing to fill out the survey could access the link and do so. Second, the author sent group e-mails to all the members in each group to invite them to participate in the study. To achieve better response rates, the author later sent individual QQ e-mails to each member within a group. The letter included a brief introduction to the purpose of the current study, the expected time to finish the survey and a description of the rewards, which were four Amazon gift cards, each worth fifty dollars. The letter is attached in Appendix C.

The QQ groups that the author joined were unofficial student alliances of the following universities: 1) New York University, 2) Michigan State University, 3) University of California-Riverside, and 4) Marquette University. The author also joined another QQ group comprised of approximately 1000 Chinese students from

different universities in the U.S. Six other universities that the author had reached were as follows: 1) Purdue University, 2) Kansas State University, 3) University of Wisconsin-Milwaukee, 4) Loyola University-Chicago, 5) Case Western University, and 6) University of Texas-Dallas. For these six universities, the author had encountered difficulties in joining in the groups due to technical issues. Instead, the author sent the messages to students in these universities and the students forwarded the messages to other students using QQ. Apart from having access to the student body at the above universities, these universities were selected according to other standards as well. Most of the universities selected have a substantial number of Chinese students. Purdue University, for example, enrolled 3,880 Chinese students during 2012-2013 (Purdue University Data Digest). Geographical diversity was also considered when choosing the universities, although most of them are located in the Midwestern area of the United States, the author made sure that there was at least one in the Eastern area, one in the Western area, and one in the Southern area.

The survey was in the field for two weeks in 2015, from April 1st to April 14th. The last reminder was sent on April 12th. The recruitment letter reached approximately a total of 4,000 members in the QQ groups and 248 responses were obtained. The response rate for the survey was roughly 6.2%, which was significantly below the average of 33% response rate in e-mail surveys (Nulty, 2008). Several reasons may account for the low response rate. First, with a screening question, the author pointed out in the recruitment letter that the survey was targeted at female students who were between the ages of 18 to 26. The

explanation of the targeted population would have excluded male students and students who did not fall into the age range from participating in the survey. Second, although QQ was still one of the most widely used social interaction softwares in the Chinese community, an increasing number of students have turned to software that provides more privacy and excludes strangers from contacting them without consent. Third, the members in a QQ groups might not be current students studying in the universities. There was a possibility that some members were former students who have returned to China and potential students who looked forward to entering the universities. There were also commercial members who wished to promote their products in the groups, which targeted at Chinese students overseas. Finally, contacting individuals through QQ groups was usually regarded as an informal way of communication. Some students might discard the messages they received on QQ. The author also asked a screening question at the start of the questionnaire to exclude individuals who were not native Chinese students between the ages of 18-26 currently studying at a university in the U.S. The questionnaire introduction also provided a clear explanation that only individuals who fell into that group should participate in the study.

After deleting surveys that were completed less than 96%, a total of 173 responses were obtained. The completion rate of the survey is 70.0%. Since the questions in the survey were set as forced answers, the missing data were only from the demographic section that was located at the end of the survey. Missing data for scaled variables were replaced with corresponding means as appropriate. The Amazon gift cards were sent out immediately after the survey was closed. Four

recipients who had given their e-mail address at the end of the survey were randomly selected. The average age of the respondents was 23.0 (N=173) with the majority of the participants (N=83) being master's level graduate students (53.6%). Forty point seven percent of the participants were undergraduate students (N=62) and 5.6% of them (N=9) were doctoral students. Almost all of the respondents were from Mainland China (N=158); only four of them were from Hong Kong/Macau Special Administrative Regions.

Instrumentation

The survey questionnaire contained sixty-six items. Each of the RISP variables employed in the study was measured by at least two items. Other items include demographic questions such as age and region, questions asking participants about the frequency they encountered HPV information in media, and objective knowledge questions used for measuring the level of HPV knowledge among the participants. The RISP-based items were adopted from previous research employing the RISP model. The survey mostly adopted the questionnaire from the master's thesis of Calhoun's (2012).

The survey questionnaire was administered via Qualtrics.com, an online questionnaire software widely used among researchers. The first section of the survey was a consent form providing basic information about the principal investigator, the purpose of the study, the possible risks and benefits of participating in the study, and the explanation of confidentiality. After the participants viewed the content, there was an "I agree" button at the bottom of the

page. By clicking on the button, the respondent agreed to participate the study, otherwise they could choose to exit the survey. Followed by the consent form was a screening question asking if the respondent was a Chinese female student currently studying in a U.S university. Qualtrics would automatically direct the respondent to the end of the survey if the respondent answered “No” to this question. Pages were divided according to the topic of the variables, as well as to promote the visual comfort of the participants. Each question was set as forced answer, thus the participants would have to answer all of the questions on one page in order to enter next page. After the participants had answered all of the questions, there was another page asking them if they would like to be considered for the prize drawing. A link led them to a separate page for them to enter their e-mail addresses. This identifying information was separated from the responses after the survey was complete.

Measured Variables

This section discusses the variables measured in the current study. Factor analyses were conducted to test the variables measured by two or more questionnaire items. According to the results of the factor analyses, redundant items were deleted to improve the internal consistency of the summated scales. Reliability tests were run on these summated scales and the Cronbach’s Alpha’s values were recorded. For variables that were measured by only one item, the mean values and standard deviations were recorded. The tables can be found in the appendix.

Information Seeking and Information Avoidance

To measure the variable “Information Seeking,” participants were asked to choose, via a 5-point Likert scale, whether they (1) *strongly disagree*, (2) *disagree*, (3) *feel neutral*, (4) *agree*, or (5) *strongly agree* with the following statements: first, “When the topic of HPV comes up, I try to learn more about it” (Mean=4.02, SD=.72); second, “When this topic comes up, I’m likely to go out of my way to get more information” (Mean=3.50, SD=.80); and third, “When it comes to the topic of HPV, I’m content to let information come to me in the course of my daily life” (Mean=3.71, SD=.75). Factor analysis was conducted on the three items. The analysis extracted one component with all three items loading heavily on this factor. The Cronbach’s alpha of the reliability test was .42, which was below the acceptable value of .50. However, deleting any of the three items would not improve the reliability. Thus, all three items were preserved for further analysis of the hypotheses.

To measure the variable “Information Avoidance,” the same Likert-scale was used. Participants were asked to indicate whether they agreed with the following four statements: first, “When the topic of HPV comes up, I’m likely to tune it out” (Mean=2.87, SD=1.06); second, “What I know about this topic is enough” (Mean=2.54, SD=.97); third, “Gathering a lot of information about HPV is a waste of time” (Mean=2.20, SD=.88); and fourth, “Whenever the topic of HPV comes up, I go out of my way to avoid learning more about it” (Mean=2.36, SD=.97). Factor analysis on the four items extracted two factors, with the last two items loading heavily on the first factor and the first two items loading heavily on the second factor. The first two items also loaded moderately on the first factor. After deleting the item “When

the topic of HPV comes up, I'm likely to tune it out", only one factor was extracted. In terms of the reliability test, the value of Cronbach's alpha rose from .48 to .52. Since the value of Cronbach's alpha below .50 is considered unacceptable, this item was deleted and was not included in further analysis.

Systematic Processing and Heuristic Processing

To measure the variable "Systematic Processing," participants were asked whether they (1) *strongly disagree*, (2) *disagree*, (3) *feel neutral*, (4) *agree*, or (5) *strongly agree* with a series of statements about their information processing habits. These statements were as follows: first, "After thinking about information on this topic, I have a broader understanding" (Mean=3.71, SD=.72); second, "It is important for me to interpret information about the risks of HPV in a way that applies directly to my life" (Mean=3.86, SD=.74); third, "If I need to act on preventing HPV, the more viewpoints I get the better" (Mean=3.81, SD=.70); and fourth, "When this topic comes up, I'm likely to stop and think about it (Mean=3.27, SD=.92).

Factor analysis was conducted on all information processing items, which included items measuring "Heuristic Processing." The statements for heuristic processing were the following four: first, "When this topic comes up, I rarely spend much time thinking about it" (Mean=2.91, SD=1.00); second, "When I encounter information about HPV, I focus on only a few key points" (Mean=3.18, SD=.89); third, "There is far more information on this topic than I personally need" (Mean=3.35,

SD=.82); and fourth, “If I need to act on preventing HPV, the advice of one expert is enough for me” (Mean=3.06, SD=.92).

Factor analysis on all eight information processing items extracted three factors, with three items loading heavily on systematic processing, and two loading heavily on heuristic processing. If item “When this topic comes up, I’m likely to stop and think about it” was deleted from systematic processing; items “If I need to act on preventing HPV, the advice of one expert is enough for me” and “There is far more information on this topic than I personally need” were deleted from heuristic processing, two factors respectively representing systematic and heuristic processing were extracted. The deletion of the items also increased Cronbach’s alpha value from .44 to .56 for systematic processing, and .45 to .50 for heuristic processing.

Information Insufficiency

In terms of measuring information insufficiency, two self-report items were used: first, the current knowledge about the risk of the participants, and second, the information sufficiency threshold. Participants were asked to choose from zero to 100 indicating the knowledge they thought they currently had, with zero meaning knowing absolutely nothing and 100 meaning knowing everything a person could possibly know about HPV. After participants answered the current knowledge question, they were asked to indicate how much knowledge they thought they needed in order to confidently deal with the risks of HPV. This question was also asked using a zero-100 scale. The text for the question was written as “Please

estimate the amount of knowledge you currently have about the possible risks to you from HPV. Then estimate the ideal amount of knowledge you would like to have to deal adequately with this risk in your life.” Instead of using the difference between information sufficiency threshold and current knowledge, information insufficiency was measured by regressing sufficiency threshold on current knowledge so the residual of sufficiency threshold represents information insufficiency. The mean value for current knowledge was 42.72 (SD=26.51) and 75.14 (SD=22) for sufficiency threshold. Apart from the two self-reported items, the questionnaire also contained six Likert-scale questions for measuring information insufficiency as a back-up for the above pair of measures in case respondents had demonstrated difficulty in understanding the two-item measure of information insufficiency. During the analysis, only the original two self-reported items were used.

Perceived Information Gathering Capacity

To measure the variable “Perceived Information Gathering Capacity,” participants were asked to indicate how well they could gather information about HPV risks, and choose from (1) *strongly disagree*, (2) *disagree*, (3) *feel neutral*, (4) *agree*, and (5) *strongly agree* for the following statements. First, “I would know where to go for information I could rely on” (Mean=3.66, SD=.86); second, “It is hard for me to get useful information about this topic” (Reversed Coded; Mean=3.34, SD=.92); third, “I would know how to separate fact from fiction” (Mean=3.50, SD=.80); fourth, “I am able to get and make sense of information on this topic”

(Mean=3.75, SD=.69); fifth, “I would know what questions to ask the experts” (Mean=3.49, SD=.78); and sixth, “I could readily take the time to gather any additional information I might need” (Mean=3.62, SD=.77).

Factor analysis was conducted on all six items and extracted two distinct factors. Five of the six items loaded heavily on factor 1, with only the reverse coded item “It is hard for me get useful information about this topic” loading heavily on the second factor. After the deletion of the reverse coded item, factor analysis only extracted one factor and Cronbach’s alpha increased from .72 to .80. In order to improve the internal consistency for the measuring of perceived information gathering capacity, this item was not included in the summated scale for future analysis.

Self-Efficacy

To measure the variable “Self-Efficacy,” participants were asked to indicate how confident they were to deal with the risks of HPV. Two sets of questions, each focused on different aspect of preventing HPV (HPV vaccine and performing safe sex), were asked. Participants needed to indicate whether they *(1) strongly disagree, (2) disagree, (3) feel neutral, (4) agree, or (5) strongly agree* with the following statements. For performing safe sex, two statements were provided: first, “I believe that practicing safe sex would protect me against the virus” (Mean=3.76, SD=.86); and second, “In my life, it would be easy for me to perform safe sex to avoid getting infected with HPV” (Mean=3.80, SD=.89). For HPV vaccine, four statements were provided: first, “I have access to HPV vaccination” (Mean=3.10, SD=.99); second,

“HPV vaccine is affordable to me” (Mean=3.30, SD=.81); third, “It would be easy for me to get vaccinated against HPV” (Mean=3.29, SD=.75); and fourth, “I believe that HPV vaccination is good protection for me against the virus” (Mean=3.87, SD=.79). The vaccine questions were only asked of participants who had heard of HPV vaccination (N=98). This smaller N unfortunately limited the usefulness of the measures of HPV vaccine efficacy in the data analysis that followed.

Since the vaccine questions were answered by a relatively small number of participants, factor analyses were conducted separately on safe-sex self-efficacy and vaccine self-efficacy. In both cases, only one factor was extracted from the analysis and all items loaded heavily on the one factor. Cronbach’s alpha was .80 for safe-sex self-efficacy and .72 for vaccine self-efficacy.

Informational Subjective Norms

To measure the variable “Informational subjective norms,” participants were asked about their perception of the knowledge of HPV risks among other Chinese women (descriptive ISN) and the expectations from the participants’ important others (injunctive ISN). Participants needed to indicate whether they (1) *strongly disagree*, (2) *disagree*, (3) *feel neutral*, (4) *agree*, or (5) *strongly agree* with the following statements. First, “Most of other Chinese female college students in the U.S stay informed about the risks of getting infected with HPV” (Mean=2.78, SD=.93); second, “Most women who are important to me stay informed about the risks of getting infected with HPV” (Mean=2.95, SD=.95); and third, “Most people who are

important to me think that I should stay informed about the risks of HPV and the preventive techniques” (Mean=3.40, SD=.82).

Factor analysis extracted only one factor with all three items loading heavily on it. Cronbach’s alpha was .62 for the summated scale. However, since the first two items were descriptive norms which focused on describing the behaviors of relevant others, in case there could be a significant difference between descriptive norms and injunctive norms, the first two items were summated into a single scale as a new variable. Cronbach’s alpha for this scale was .60.

Negative Affects

Participants were asked to indicate, on a zero to ten scale, how much anger, worry, and uncertainty they would feel if they got infected with HPV. The question was phrased as “Now we’d like to know your feelings about the risk of getting infected with HPV. Please use a scale from zero to 10, where zero means you have ‘none of this feeling’ and 10 means you have ‘a lot of this feeling.’ When you think about the possible consequences posed to you by getting infected with HPV...How much anger/worry/uncertainty do you have?” Participants reported an average of 3.82 for anger (SD=3.90), 5.03 for worry (SD=2.89), and 5.03 for uncertainty (SD=2.74).

Risk Judgment

Risk judgment was calculated by multiplying two self-reported variables: first, the perceived risk seriousness of being infected with HPV, and second, the

perceived probability that a participant could be infected. Risk seriousness was measured by asking participants how serious they thought it could be if they get infected with HPV. Probability was measured by asking them how likely they thought they could get infected. Both questions used a zero to 100 scale with zero meaning “not at all serious” / “absolutely no chance” and 100 meaning “as serious as it can be” / “be certain to be infected.” Participants reported an average of 73.52 for risk seriousness (SD=25.38) and 28.81 for probability (SD=25.32). The new variable, risk judgment, ranged from zero to 10,000, had a mean score of 2116.06 (SD=2089.76).

Encountering HPV Information

In order to observe the media channels through which the participants had encountered information about HPV, participants were asked to indicate how often they had encountered such information in traditional media (e.g. newspaper, television, radio) and from healthcare organizations. For traditional media, two questions were asked: first, “How often have you seen information about HPV or HPV vaccine in newspapers, on TV or radio in the United States?” and second, “How often had you seen information about HPV or HPV vaccine in newspapers, on TV or radio before you came to the United States?” Participants were asked to choose from *(1) never, (2) rarely, (3) sometimes, and (4) frequently*. The mean score for information encountering after coming to the U.S was 2.14 (N=173, SD=.81). The mean score for information encountering before coming to the U.S was 1.90 (N=173, SD=.78). For healthcare organizations, two questions were asked: first, “Have you

ever received pamphlets about HPV or HPV vaccine handed out by hospitals, health providers, or health organizations in the United States?”, and second, “Had you ever received pamphlets about HPV or HPV vaccine handed out by hospitals, health providers, or health organizations before you came to the United States?”

Participants were asked to choose from Yes, once; Yes, more than one; No; and not sure. For these two questions, answers were recoded as 1 for No and not sure; 2 for Yes, once; and 3 for Yes, more than once. The average score for encountering information from healthcare organizations was 1.52 (N=173, SD=.78) for after coming to the U.S and 1.24 (N=173, SD=.58) for before coming to the U.S.

Control Variables

Observed Knowledge Level

Apart from perceived current knowledge level (part of self-reported information sufficiency), the questionnaire also contained three objective knowledge questions about the basic facts of HPV risks. Participants were asked to choose from true, false or don't know to indicate whether they had known these facts prior to taking the survey. First, participants were asked whether there was a connection between HPV and genital warts. 79 respondents (N=173) answered correctly to this question, with the percentage being 45.7%. Second, participants were asked whether there was a connection between HPV and cancers. 96 respondents (N=173, 55.5%) answered correctly. Third, participants were asked whether men could be infected with HPV. 129 respondents (N=173, 74.6%) answered correctly. Bivariate correlation was conducted between these three items

and the self-reported perceived current knowledge item. Wrong answer or “Don’t Know” was coded as 0, and right answer was coded as 1. Significantly positive relationships were found between current knowledge and all three questions ($r_1=.24, p\leq.001$; $r_2=.24, p\leq.01$; $r_3=.29, p\leq.001$). These items were used to observe the consistency between participants’ perceived current knowledge level and their objective knowledge level, and thus helped validate the former. The items were added up and then divided by three to form an average number. The scale was later used in the analysis.

Demographics

Age, region, and year in school were asked to the participants as demographic variables. Region was divided into Mainland China, Hong Kong, and Macau. Hong Kong and Macau are located at the southern coast of China and were once colonies of the United Kingdom and Portugal respectively. Hong Kong and Macau were significantly different from Mainland China in the aspects of culture and political systems. More importantly, HPV vaccine was approved in both regions but not in Mainland China. Therefore, although considered to be Chinese cities, the author believed these two regions should be examined specially. Year in school was divided into freshman, sophomore, junior, senior, graduate school (master level), and graduate school (doctoral level). The average age of the participants was 23.0 ($N=162, SD=1.79$) with the mode being 24-years-old. 87 out of 162 participants were master level graduate students (53.7%). Only four participants came from

places other than Mainland China. Two of them came from Hong Kong and two of them came from Macau.

For participants who had received HPV vaccination, a question was asked to determine where they received it. Four options were provided: United States, Hong Kong/Macau, Mainland China, and Other. Out of 76 participants, 66 of them received their vaccination in the United States, four of them received it in Mainland China, one of them received it in Hong Kong/Macau, and five of them indicated other.

Analysis

Data were analyzed primarily using multiple regression in Statistical Package for Social Sciences (SPSS) 19.0 and path analysis in AMOS 21.0.

To address RQ1, RQ2 and test H1, H2a, H2b, H3a, H3b, and H3c, multiple regression tests were run between information seeking/processing and other variables in RISP model, including risk judgment, negative affects, informational subjective norms, perceived information gathering capacity, and information insufficiency. Current knowledge was entered first to remove its variance from sufficiency threshold, which therefore represented information insufficiency in later analysis. Age, as a control variable, was also entered in the multiple regression tests. Year in school was not used as a control variable since it was highly correlated with age ($r=.69$, $p\leq .001$), and thus the author used age as the more sensitive measure of the two. Region was also excluded from the analysis since only four out of 173 students came from places outside Mainland China. The number was too small to be used effectively in the analysis. To address RQ3, RQ4 and test H4, H5a, and H5b, multiple regression tests were run between negative affects and other variables in

the hypotheses, including age, current knowledge, sufficiency threshold, self-efficacy, and risk judgment. To address RQ5, age was entered in all analyses in order for the author to determine whether it exerted an influence on the information seeking and processing behaviors. Linear regressions were also run between age and other variables such as self-efficacy and current knowledge level. To address RQ6, a multiple regression test was run between current knowledge and other variables, which might have an impact on the current knowledge level among Chinese female college students about HPV.

After all the research questions were addressed and all the hypotheses were tested using multiple regression in SPSS, the author ran several path analyses to generate a general idea about the risk information seeking and processing model in the current study. The path analyses were also hoped to provide directions for future studies.

IV. RESULTS

Multiple Regression

Table 1 shows the outcomes of the multiple regression tests run to calculate the relationships between the independent variables in RISP model and the dependent variables of information seeking, avoidance, systematic information processing, and heuristic processing.

Self-efficacy in the current study was tested in two aspects: performing safe sex and beliefs in HPV vaccine. The questions regarding HPV vaccine were only asked to those participants who had heard of HPV vaccine prior to taking the survey, thus, the total number of respondents who answered that set of questions was 99, which was a relatively small sample size. Therefore, self-efficacy, although a significant predictor in the RISP model, was not entered into the multiple regressions on information seeking/processing. Instead, they were run through a different multiple regression to test the specific hypotheses.

Table 1: Relationship of Information Insufficiency, Information Seeking, Information Avoidance, Systematic Processing, Heuristic Processing, to RISP Model

	Sufficiency Threshold	Info Seeking	Info Avoidance	Systematic Processing	Heuristic Processing
	Beta (sig.)	Beta (sig.)	Beta (sig.)	Beta (sig.)	Beta (sig.)
Current Knowledge	.30c	.08	.28c	.11	-.12
ΔR^2	.11	.06	.04	.08	.02
Age	.02	-.04	.02	.03	-.08
ΔR^2	0	.06	0	0	.01
Risk Judgment	-.03	.10	.24c	.04	.11
ΔR^2	.001	.06	.08	.004	.03
Anger	-.08	.001	-.004	-.04	-.02
Uncertainty	.04	.13	.05	.12	.04
Worry	.07	.01	.09	.08	-.05
ΔR^2	.02	.09	.01	.05	.002
Informational Subjective Norms	-.05	.02	.16a	-.02	.31c
ΔR^2	0	.08		.001	.07
Perceived Information Gathering Capacity	.23b	.31c	-.20b	.42c	-.19b
ΔR^2	.05	.19	.02	.18	.04
Sufficiency Threshold	N/A	.19b	-.35c	.12a	-.16a
ΔR^2	N/A	.22	.07	.02	.02
Multiple R	.42b	.51a	.56c	.57	.44a
Adjusted R ²	.13	.22	.28	.29	.15
Overall ANOVA	F(8,172)=4.32	F(9,172)=6.22	F(9,172)=8.26	F(9,172)=8.62	F(9,172)=4.28
N	172	172	172	172	172

Significance Key: a ≤ .05, b ≤ .01, c ≤ .001

Information Insufficiency

The first research question asked about the relationships between information insufficiency and information seeking/processing styles. Specifically, H1a forecasted that the gap between the perceived amount of knowledge that the students thought they already had and the amount of knowledge they believed they needed would be positively related to active information seeking. In other words, the more insufficiency they perceived, the more likely that these students would engage in active information seeking behaviors. Secondly, H1b predicted that

information insufficiency would be negatively related to information avoidance, which meant that the more insufficiency the students perceived, the less likely they were to avoid information about HPV. The results indicated that information insufficiency, represented by the variable "sufficiency threshold" in these analyses, had a significantly positive relationship with information seeking ($\beta = .19$, $p \leq .01$) and a significantly negative relationship with information avoidance ($\beta = -.35$, $p \leq .001$). H1a and H1b were therefore both supported by the results.

In terms of information processing styles, the hypotheses predicted that information insufficiency would be positively related to systematic information processing and negatively related to heuristic information processing. The hypotheses implied that the more insufficiency the students perceived, they would be more likely to process information about HPV systematically and less likely to think about the information using heuristics. The results again supported this set of hypotheses. Information insufficiency was found to have a positive relationship with systematic processing ($\beta = .12$, $p \leq .05$) and a negative relationship with heuristic processing ($\beta = -.16$, $p \leq .05$).

The strongest relationship among the ones found between information insufficiency and information seeking/processing behaviors was the negative correlation of insufficiency to information avoidance. Other relationships, although tested to be significant, were relatively weak.

Informational Subjective Norms

The second research question asked about the relationship between informational subjective norms and information insufficiency, information seeking, avoidance, systematic processing, and heuristic processing. Informational subjective norms referred to the normative pressure individuals perceived from significant others, as well as the larger society. Specifically, H3a predicted a positive relationship between informational subjective norms and information insufficiency, which implied that the more pressure students felt from others, the more likely they would perceive a larger gap between the knowledge they already had and the knowledge they needed to confidently deal with the risks. H3b forecasted that there would be a positive relationship between informational subjective norms and active information seeking. H3c forecasted a negative relationship between the norms and information avoidance. H3b and H3c implied that the more pressure the students felt from others, the more likely they would engage in active information seeking activities and less likely to intentionally avoid information about HPV. H3d indicated that there would be a positive relationship between informational subjective norms and systematic processing, and H3e indicated a negative relationship between the norms and heuristic processing. This set of hypotheses predicted that the more pressure students felt from others, the more likely they would systematically process information about HPV and less likely to use experiences and heuristics to make judgments.

Two types of informational subjective norms were tested in the current study: descriptive norms, which described the behaviors of other people; and injunctive

norms, which referred to the pressure of what other people expect the students to do when it came to HPV risks. No significant differences were found between descriptive norms and injunctive norms in the currently study. Thus, the variable was treated as a summated scale that encompassed both types of the norms in the analysis.

None of the hypotheses regarding informational subjective norms were supported in the current study. For information insufficiency (beta=-.05, *ns*), information seeking (beta=.02, *ns*), and systematic processing (beta=-.02, *ns*), the results indicated non-significant relationships with informational subjective norms. Interestingly, the results supported opposite relationships from what the hypotheses predicted with information avoidance (beta=.16, $p \leq .05$) and heuristic processing (beta=.31, $p \leq .001$). The more pressure the students felt from others, the more likely they would intentionally avoid information about HPV and process the information using experiences and heuristics. The reasons that might account for the opposite results will be considered in the discussion section..

Negative Affects

Negative affects were tested to be significant predictors of information seeking/processing behaviors in RISP model. RQ3 and H4 proposed that there would be a positive relationship between negative affects and information insufficiency. The hypothesis predicted that the more negative emotions the students felt toward the risks of HPV, a larger gap would exist between the current knowledge the students had and the knowledge they needed to deal with the risks.

Three forms of negative emotions were examined in the current study: worry, anger, and uncertainty. In order to observe the effects of different kinds of emotions on information behaviors about the risks of HPV, the three forms of emotions were treated separately in the analysis. The hypothesis was not supported by the results of the multiple regression tests. Non-significant relationships were found between all three forms of negative affects and information insufficiency. The standardized beta coefficients were $-.08$ for anger (*ns*), $.04$ for uncertainty (*ns*), and $.07$ for worry (*ns*). The results indicated there were no relationships between the negative emotions the students held toward the risks of HPV and the information insufficiency they perceived.

Risk Judgment

H5a forecasted a positive relationship between risk judgment and negative affects, that the more severe and likely the students perceived the risks of HPV were, the more negative emotions they would hold toward them. Risk judgment and self-efficacy were entered into a separate multiple regression analysis for the author to examine the relationship between them and negative affects due to the small sample of participants who answered all the self-efficacy questions. Table 2 and Table 3 show the outcomes of these multiple regression tests. Self-efficacy on performing safe sex and HPV vaccine was treated separately in these tests.

Table 2: Relationships of Negative Affects to Risk Judgment, and Self-Efficacy re HPV Vaccine

	Worry	Anger	Uncertainty
	Beta (sig.)	Beta (sig.)	Beta (sig.)
Age	-.11	.14	0
ΔR^2	.01	.01	.001
Self-Efficacy re HPV Vaccine	.14	-.08	-.02
ΔR^2	.01	.01	.002
Risk Judgment	.33c	.29b	.23a
ΔR^2	.11	.08	.05
Multiple R	.36c	.33c	.24a
Adjusted R ²	.11	.08	.03
Overall ANOVA	F(3,114)=5.64	F(3,114)=4.41	F(3,114)=2.20
N	114	114	114

Significance Key: a ≤ .05, b ≤ .01, c ≤ .001

Table 3: Relationships of Negative Affect to Risk Judgment and Self-Efficacy re Performing Safe Sex

	Worry	Anger	Uncertainty
	Beta (sig.)	Beta (sig.)	Beta (sig.)
Age	-.06	.16a	-.02
ΔR^2	0	.02	0
Self-efficacy re Safe Sex	.15a	-.03	.09
ΔR^2	.01	.003	.003
Risk Judgment	.37c	.32c	.31c
ΔR^2	.13	.10	.09
Multiple R	.38c	.36c	.31c
Adjusted R ²	.13	.11	.08
Overall ANOVA	F(3,172)=9.53	F(3,172)=8.41	F(3,172)=6.07
N	172	172	172

Significance Key: a ≤ .05, b ≤ .01, c ≤ .001

The hypothesis was supported by the results. Significantly positive relationships were found between risk judgment and all three forms of negative affects. When self-efficacy on HPV vaccine was entered as an independent variable, the coefficients were .33 ($p \leq .001$) for worry, .29 ($p \leq .01$) for anger, and .23 ($p \leq .05$) for uncertainty. When self-efficacy on performing safe sex was entered as an independent variable, the coefficients were .37 ($p \leq .001$) for worry, .32 ($p \leq .001$) for anger, and .31 ($p \leq .001$) for uncertainty. The results indicated that with the

increase of probability and severity of HPV risks the students perceived, the worry, anger, and uncertainty they had about HPV risk also increased.

Self-Efficacy

Self-efficacy in RISP model refers to the beliefs that an individual holds about his or her capacity to deal with a specific risk. H5b specifically forecasted its relationship with negative affects, that the more self-efficacy the students had, the less negative emotions they would hold toward the risks of HPV. Self-efficacy was divided into the efficacy on performing safe sex and the efficacy on HPV vaccine. In terms of self-efficacy on performing safe sex, the coefficients were .15 for worry ($p \leq .05$), -.03 for anger (*ns*), and .09 for uncertainty (*ns*). The relationship detected in the analysis between worry and self-efficacy was the opposite to what the model proposes. In terms of the efficacy on HPV vaccine, a beta of .14 was found for worry (*ns*), -.08 for anger (*ns*), and -.02 for uncertainty (*ns*). The results indicated irrelevance between self-efficacy from vaccination and negative affects among Chinese female college students' perception of the risks of HPV, and a weak correlation between self-efficacy on performing safe sex and the emotion of anger.

Age

In the attempt to examine the impact that age had on the information behaviors of Chinese female college students, age was entered as an independent variable in all multiple regression tests. No significant direct relationships were found between age and the information seeking/processing behaviors, and the

amount of negative emotions the participants perceived. However, after running bivariate correlations between age and other variables in the study, the author found several significant relationships that could indicate the part where age played a role in the information behaviors.

When age as entered into the analysis of the relationships of risk judgment and self-efficacy on performing safe sex to negative affects, an analyses which has a larger N and thus is more sensitive than the analysis related to vaccination, positive relationship was found between age and anger ($\beta=.16$, $p\leq.05$, see Table 3). The results indicated that the older the participants were, the more anger they felt if they were to get infected with HPV.

Age was significantly related to both self-efficacy on performing safe sex ($\beta=.27$, $p\leq.001$, see Table 4) and on HPV vaccine ($\beta=.17$, $p\leq.05$, see Table 4). The results showed that as age increased, the confidence of protecting selves from dangerous sexual behaviors also increased among Chinese female college students. The confidence in HPV vaccine also increased.

Table 4: Relationship of Age to Self-Efficacy

Independent Variable	Self-Efficacy (Safe Sex) Beta (Sig.)	Self-Efficacy (HPV Vaccine) Beta (Sig.)
Age	.27c	.17a
Adjusted R ²	.07	.02
Overall Anova	F(1, 172)=13.80	F(1, 114)=3.17
N	172	114

Significance Key: a \leq .05, b \leq .01, c \leq .001

Age was also found to relate to the amount of current knowledge about HPV among the surveyed population, the results will be reported in the next section.

Knowledge Level

RQ6 asked about the knowledge level of HPV among Chinese female college students in the United States. The analysis of the knowledge level was broken into two parts: one that provided percentages of students who had heard of HPV, and one multiple regression test that indicated the factors influencing the current knowledge level. The self-reported current knowledge level showed an average score of 42.72 (N=173, SD=26.51). 57.2% (n=99) of the participants had heard of HPV prior to taking the survey (N=173). Out of these participants, 54.5% (n=54) of them heard the virus in the United States (N=99). Twenty-six percent of the participants had heard of HPV before coming to the U.S (N=173). Fifty-six point six percent (n=98) of the respondents had heard of HPV vaccine prior to taking the survey (N=173); 56.1% (n=55) of these respondents got to know the vaccine in the U.S, which made the percentage of participants who heard of the vaccine in China 24.9%. Forty-five point seven percent (n=79) of the participants gave the right answer to whether HPV had a connection with genital warts; 55.5% (n=96) of them answered rightly to the question whether HPV was connected to cancer; 74.6% (n=129) were aware that HPV increased the risk of cervical cancer; and 68.8% (n=119) of the participants answered correctly to whether men could be affected by HPV.

Age, risk judgment, information encountering, and observed knowledge level were entered into a multiple regression test to examine their relationships with self-reported current knowledge (part of the information sufficiency measure) about HPV among these students (see Table 5).

Table 5: Relationship of Current Knowledge to Age, Risk Judgment, and Frequency of Encountering Information in Media

Independent Variables	Current Knowledge Beta (sig.)
Age	.17b
ΔR^2	.04
Risk Judgment	.15a
ΔR^2	.05
Information Encountering (Traditional Media Before Coming to the U.S)	.01
Information Encountering (Traditional Media in the U.S)	.28c
Information Encountering (Pamphlets from Healthcare Organizations before Coming to the U.S)	.20b
Information Encountering (Pamphlets from Healthcare Organizations the U.S)	.12
ΔR^2	.26
Observed Knowledge	.23c
ΔR^2	.05
Multiple R	
Adjusted R ²	.38
Overall ANOVA	F(7,172)=15.82
N	172

Significance Key: a \leq .05, b \leq .01, c \leq .001

The results showed a significantly positive relationship of age to current knowledge (beta=.17, $p\leq$.01). With the increase of age, the self-reported level of current knowledge about HPV also increased among the surveyed population. Risk judgment was also found to positively relate to current knowledge (beta=.17, $p\leq$.05). The result indicated that the more severe and likely the perceived risks of HPV, she would be more likely to possess more knowledge about the risk.

Information encountering in traditional media in the U.S was significantly related to the current knowledge (beta=.28, $p\leq$.001), which meant the more frequently a student encountered information about HPV in U.S traditional media, she would possess more knowledge about the risk. Interestingly, when it came to healthcare

organizations, information encountered prior to coming to the U.S was found related to current knowledge level ($\beta=.20, p \leq 0.1$). Observed knowledge level was entered into the analysis to examine the consistency between the actual knowledge and self-reported knowledge. Significant relationship was found ($\beta=.23, p \leq .001$), which indicated moderate consistency.

Other Significant Relationships between Variables

Current Knowledge and Information Avoidance

Current knowledge was found to have a significant relationship to information avoidance ($\beta=.28, p \leq .001$). The result indicated that the more knowledge the participants had about HPV, the more likely they would choose to intentionally avoid information about it.

Risk Judgment and Information Avoidance

Risk judgment in the current study was found to have a significant relationship to information avoidance ($\beta=.24, p \leq .001$). The relationship suggested that the more severe and likely the participants perceived the risk of HPV, the more likely they would avoid information about it intentionally.

Perceived Information Gathering Capacity and Information Insufficiency and Seeking/Processing

Significant relationships were found between perceived information gathering capacity and information insufficiency, information seeking, avoidance,

systematic processing, and heuristic processing. Perceived information gathering capacity in the RISP model refers to the ability an individual has to obtain and process the information they need to deal with a specific risk. It was found positively related to information insufficiency ($\beta=.23$, $p \leq .01$, see Table 1), which indicated that the more capacity one believed she had to attain and process information, the more likely she would have a higher sufficiency threshold. The multiple regression also suggested a positive relationship of perceived information gathering capacity and information seeking ($\beta=.31$, $p \leq .001$), meaning the more capacity of gathering information one perceived, the more likely she would engage in active information seeking behaviors. Similarly, perceived information gathering capacity was found negatively related to information avoidance ($\beta=-.20$, $p \leq .01$).

In terms of information processing styles, perceived information gathering capacity was positively related to systematic processing ($\beta=.42$, $p \leq .001$) and negatively related to heuristic processing ($\beta=-.19$, $p \leq .01$). The results indicated that the more capacity one believed she had in attaining and processing information, the more likely she would process the information systematically and in depth, and less likely to process it using experiences and heuristics.

Current Knowledge and Negative Affects

Significant relationships were found between current knowledge and negative affects (See Table 6). Worry and anger was positively related to current knowledge, this indicated that the more knowledge about HPV one possessed, the more worry and anger she would feel about the risks of HPV. The coefficient for

uncertainty and current knowledge had a negative value, but the relationship was non-significant ($\beta = -.05$, *ns*).

Table 6: Relationships of Current Knowledge to Negative Affects

Independent Variable	Worry Beta (Sig.)	Anger Beta (Sig.)	Uncertainty Beta (Sig.)
Current Knowledge	.14a	.27c	-.05
Adjusted R ²	.01	.07	-.004
ANOVA	F(1, 172)=3.4	F(1, 172)=13.54	F(1,172)=.38
N	172	172	172

Significance Key: a ≤ .05, b ≤ .01, c ≤ .001

Total Variance Accounted for

The regression models produced significant multiple-*R* correlation coefficients for information insufficiency ($R = .42$, $p \leq .01$), information seeking ($R = .51$, $p \leq .05$), information avoidance ($R = .56$, $p \leq .001$), heuristic processing ($R = .44$, $p \leq .05$). The model did not produce significant multiple-*R* for systematic processing. The RISP model (excluding self-efficacy) explained 13 percent of the variance for information insufficiency (Adjusted $R^2 = .13$, $F(8,172) = 4.32$, $p \leq .001$), 22 percent of the variance for information seeking (Adjusted $R^2 = .22$, $F(9,172) = 6.22$, $p \leq .001$), 28 percent of the variance for information avoidance (Adjusted $R^2 = .28$, $F(9,172) = 8.26$, $p \leq .001$), 29 percent of the variance for systematic processing (Adjusted $R^2 = .29$, $F(9,172) = 8.62$, $p \leq .001$), and 15 percent of the variance for heuristic processing (Adjusted $R^2 = .15$, $F(9,172) = 4.28$, $p \leq .001$).

Path Analysis

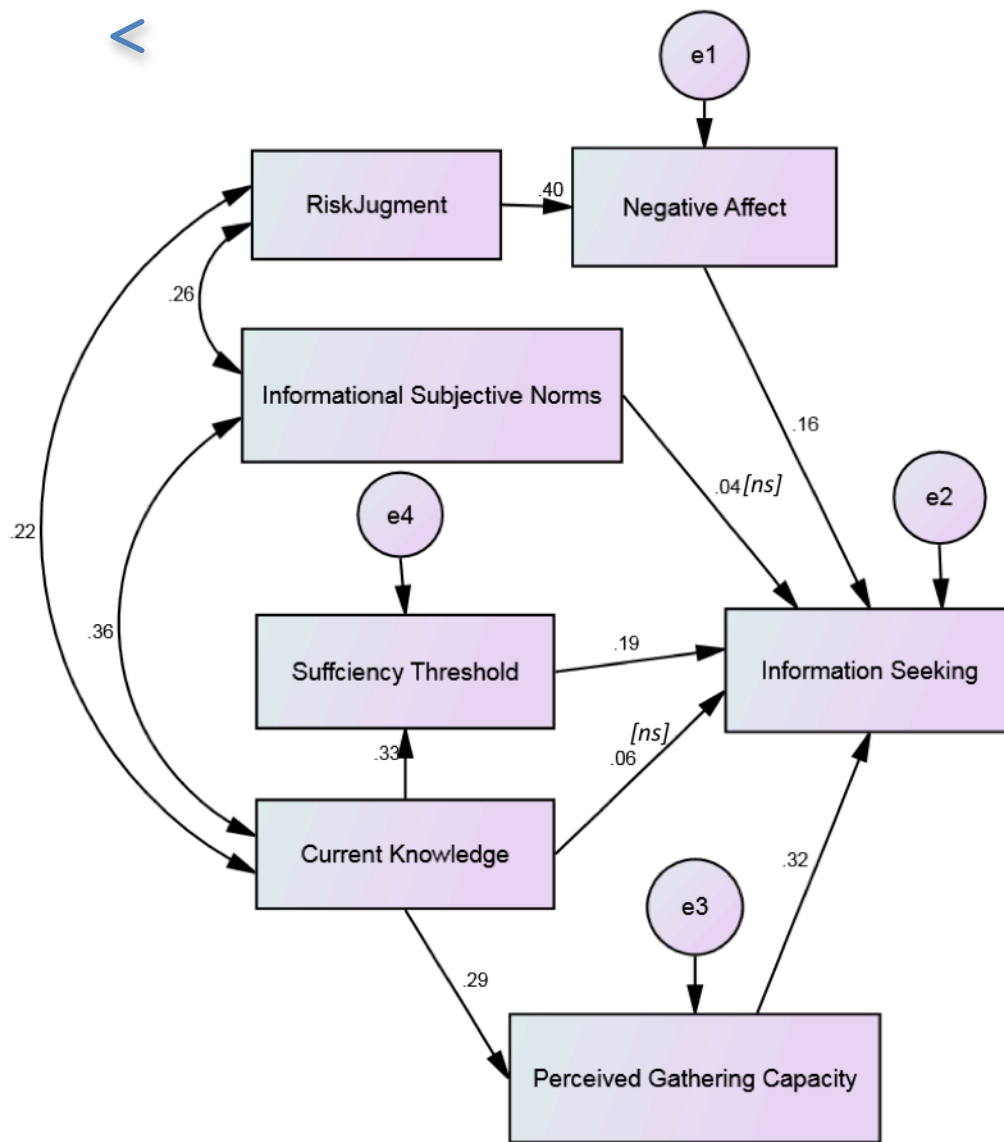
In the hope of summarizing and further supporting the results from multiple regressions, as well as providing research directions for future studies, path

analyses were done between the independent variables in RISP and information seeking, avoidance, systematic processing, and heuristic processing. Four models (Model 1: information seeking, Model 2: information avoidance, Model 3: systematic processing, and Model 4: heuristic processing) were generated using SPSS AMOS 22.0 (See Figure 3, Figure 4, Figure 5, and Figure 6). χ^2 goodness-of-fit statistics (Chi-Square) is often reported in the results as an index of model adequacy where a non-significant value of p indicates good model fit. However, because χ^2 is sensitive to sample size and models generated from large sample size are sometimes rejected unfairly, the χ^2/df ratio (relative Chi-Square) is more often used now as an index of model fit. Only the ratio is reported in the current study to test the model fit. A value of less than 5 is considered to be a good fit of model (Kline, 2005). The goodness-of-fit (GFI) index is also reported for the proposed models, which is a measure of model fit between the hypothesized model and the observed covariance matrix. A value exceeding .90 is generally considered as a good model fit (Byrne, 1994). Additionally, the root mean square error of approximation (RMSEA) is reported in the results. The RMSEA reports the error of approximation in the population and has been recognized as an exceptionally informative criterion of model fit (Byrne, 2009). A value of .08 or less indicates acceptable model fit (Browne & Cudeck, 1993), with an ideal value of .05 or less (Stieger, 1990).

Table 7: Summary of Fit Indexes

Models	df	p	χ^2/df	GFI	RMSEA
Proposed Model For Information Seeking	10	.07	1.74	.97	.07
Proposed Model for Information Avoidance	10	.003	2.67	.96	.10
Proposed Model For Systematic Information Processing	10	.10	1.59	.98	.06
Proposed Model for Heuristic Processing	10	.06	1.76	.97	.07

Information Seeking

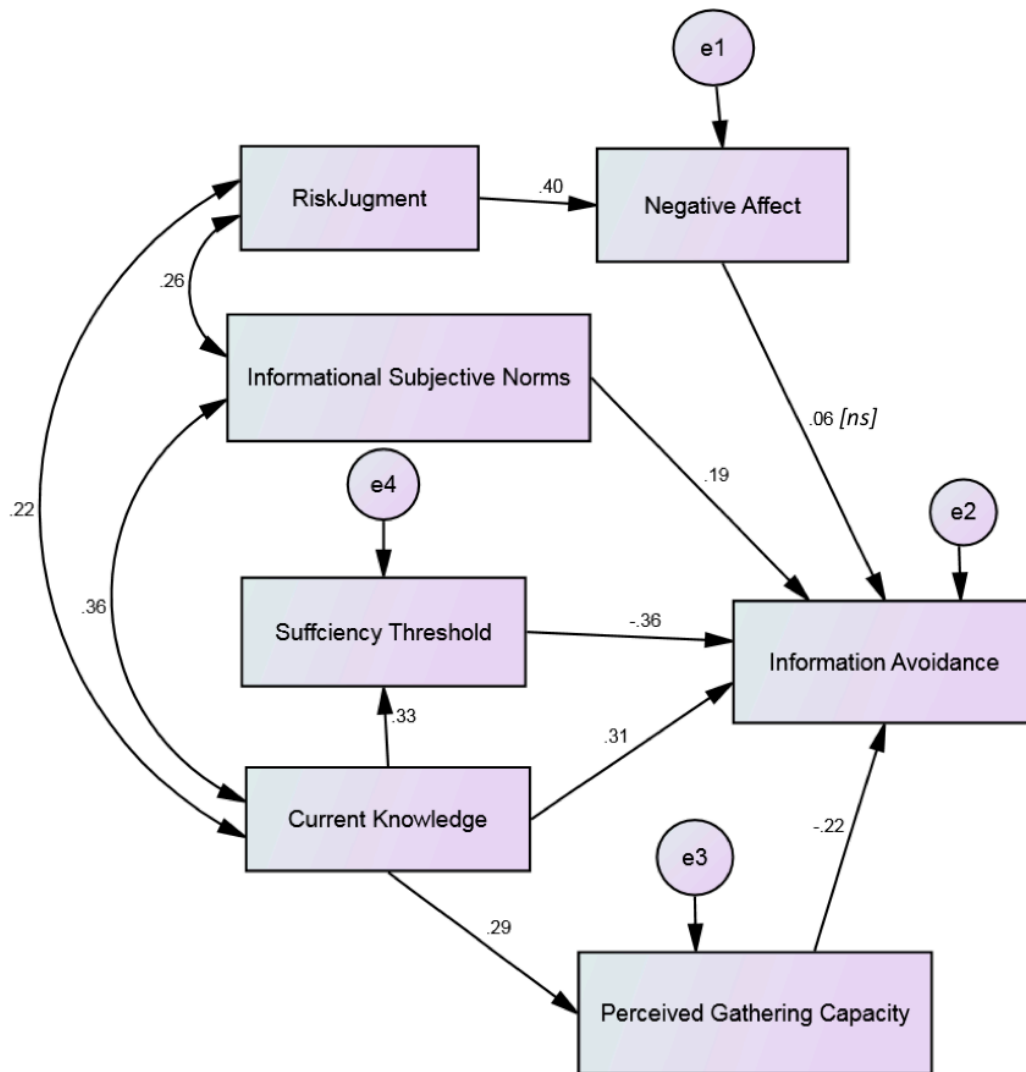


All path coefficients significant at $p=.05$ or less, unless indicated [ns].

Figure 3. Proposed Path Model for HPV Risk Information Seeking

The proposed model for HPV risk information seeking achieved a χ^2/df ratio of 1.74, a GFI of .97, and a RMSEA of .07. The small value of χ^2/df ratio and the GFI index greater than .90 indicated good model fit. The RMSEA value indicated acceptable model fit. The path model suggested there was a positive relationship of information insufficiency (beta=.19, $p \leq .001$), perceived information gathering capacity (beta=.32, $p \leq .001$) and negative affects (beta= .16, $p \leq .05$) to information seeking. The relationship between negative affects and information seeking was not detected in the multiple regression tests. The reason might be that in the path analysis, the author combined the three emotions into one variable (Cronbach's Alpha=.73), whereas in the multiple regressions, the author treated them separately. Combining them into one negative emotion might exert a stronger impact on the information seeking behaviors. The model also found a significant relationship of current knowledge to perceived information gathering capacity (beta=.29, $p \leq .001$). The results indicated that the more knowledge one perceived she had, the more confident she felt about attaining and processing information about HPV.

Information Avoidance



All path coefficients significant at $p=.05$ or less, unless indicated [ns]

Figure 4. Proposed Path Model for HPV Information Avoidance

The proposed model for information avoidance achieved a moderate χ^2/df value of 2.67 and a GFI model of .96. Both indicated good model fit. The RMSEA of the model was .10, which was higher than the acceptable value .08. Overall, the model for information avoidance displayed less adequacy than that for information seeking. The model found significant relationships of informational subjective norms (beta=.19, $p \leq .01$), information insufficiency (beta=-.36, $p \leq .001$), current knowledge (beta=.31, $p \leq .001$), and perceived information gathering capacity (beta=.22, $p \leq .01$) to information avoidance. Negative affects (beta=.06, *ns*) were not found related to information avoidance as the results were for the multiple regressions. The relationship between informational subjective norms and information avoidance was a positive one, which countered the proposed relationship in the RISP model.

Systematic Processing

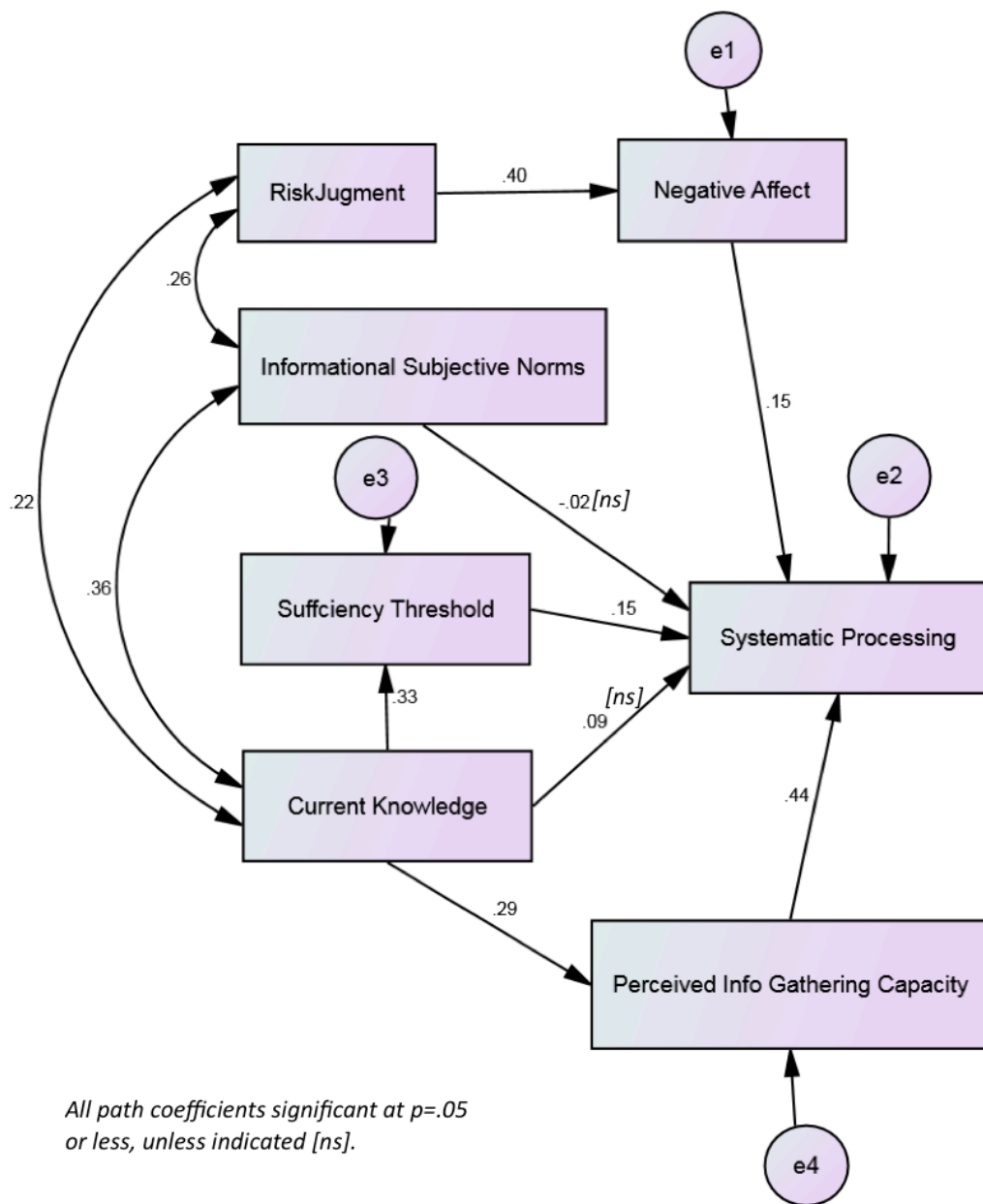
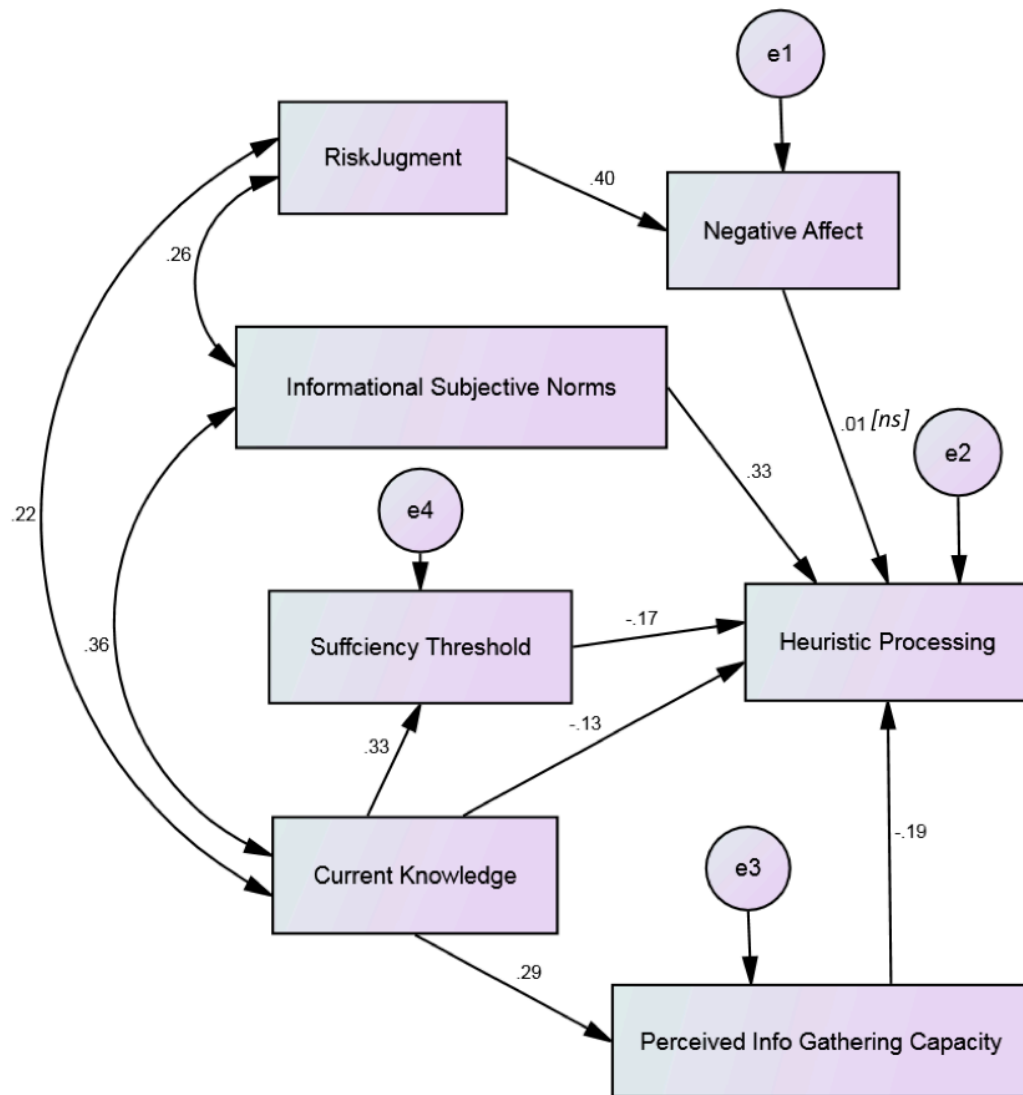


Figure 5. Proposed Path Model for HPV Systematic Information Processing

The proposed model for systematic information processing achieved a value of 1.59 for χ^2/df and .98 for GFI, both indicated good model fit. The RMSEA value was .06, which was lower than the acceptable value .08, but did not achieve the ideal value of .05. The model found significant relationships of negative affects (beta=.15, $p \leq .05$), information insufficiency (beta=.15, $p \leq .05$), and perceived information gathering capacity (beta=.44, $p \leq .001$) to systematic information processing. Similar to information seeking, negative affects were not found related to systematic processing in the multiple regressions.

Heuristic Processing



All path coefficients significant at $p=.05$ or less, unless indicated [ns].

Figure 6. Proposed Path Model for HPV Heuristic Processing

The proposed model for heuristic information processing achieved a value of 1.76 for χ^2/df , which indicated good model fit. The GFI was .97, which was higher than the acceptable value .90. The RMSEA, also, was .07, which was less than the acceptable value .08, but did not achieve the ideal value .05. Overall, the indexes indicated good model fit. Significant relationships were found of information insufficiency (beta=-.17, $p \leq .05$) current knowledge (beta=-.13, $p \leq .05$) informational subjective norms (beta=.33, $p \leq .001$), and perceived informational gathering capacity (beta=-.19, $p \leq .01$) to heuristic processing. Negative affects were not found related to heuristic processing (beta=.01, *ns*).

V. Discussion

The current study applied RISP model to examine the information seeking and processing behaviors about HPV among Chinese female college students in the United States. Although the study did not report significant relationships between certain variables in the RISP model and found opposite relationships between informational subjective norms and information avoidance and heuristic processing, the findings overall supported the RISP model.

Research Question One: Information Insufficiency

Information insufficiency, as one of the most important indicators of information seeking and processing in the RISP model, plays a vital role in the informational behaviors among Chinese female college students in the U.S. All hypotheses regarding information insufficiency were fully supported in the current study.

First, information insufficiency was positively related to active information seeking behaviors, indicating the lack of confidence of the amount of information motivates an individual to engage in information seeking activities. Although the relationship between the two variables was supported, it was a relatively weak one ($\beta = .19, p \leq .01$) compared to other significant relationships found in the model. Past research using the RISP model to examine factors related to information seeking and processing have found that participants usually reported a score of around 30 for their current knowledge, and around 60 for their sufficiency threshold score (Griffin, Powell, & et al., 2004). However, in the current study, the

participants reported higher values for both variables. The mean score was 42.27 with a standard deviation of 26.51 (N=173) for current knowledge, and 75.14 (N=173, SD=22.00) for sufficiency threshold. The higher score of current knowledge indicated that the participants believed they held moderate amount of knowledge about HPV risks, and the higher score of sufficiency threshold indicated their extensive need for information. The reason might be that the HPV is the most prevalent sexually transmitted virus worldwide and it is closely associated with female physical health. The other possible explanation is that the surveyed population has a relatively higher education level, is it reasonable to assume that they perceive a higher information need.

Second, information insufficiency was negatively related to information avoidance, which means individuals who perceived a smaller information gap were more likely to intentionally avoid information that they encountered in daily life. This negative relationship was the strongest one among all relationships between information insufficiency and information seeking/processing (beta=-.35, $p \leq .001$). The results indicated a strong tendency among these students to avoid information if they believed what they already had was enough, a result completely consistent with the RISP model. One complementary explanation for this result is that it might be that HPV, in its nature, is a sensitive topic, which might cause discomfort when a large amount of information appears. Case et al. (2005) pointed out in a study that the main reason individuals tend to avoid information is to reduce mental discomfort and dissonance. Resonating with the current study, it is reasonable to assume that the Chinese international female students tended to avoid information

that caused discomfort on a topic that they already had moderate amount of knowledge about. Unlike information seeking, past researches have not fully supported the hypothesis that information insufficiency would be negatively related to information avoidance. Few studies have found the negative relationship significant. Interestingly, in Lu's study (2015) about risk information seeking and processing during dietary acculturation, he found a significant relationship of information insufficiency to information avoidance among Chinese international students studying in the U.S. Whether there is a cultural factor rattling with the results needs to be further observed in the future.

Third, although the relationships were relatively weak, information insufficiency was found positively related with systematic processing ($\beta = .12$, $p \leq .05$), and negatively related to heuristic processing ($\beta = -.16$, $p \leq .05$). The weak relationships might be caused by the low reliability of the systematic (Cronbach's Alpha = .56) and heuristic processing scales (Cronbach's Alpha = .50). The results indicated that among Chinese female college students in the U.S, the larger of the subjective information gap was, the more likely the students would process the information with substantial amount of cognitive effort, and less likely the students would process the information using heuristics and experiences. This finding, as information seeking and avoidance, resonates with the RISP model and it is consistent with the "sufficiency principle" in HSM, which argues an individual will exert sufficient cognitive effort to process information until they have reached their sufficiency threshold.

Research Question Two: Informational Subjective Norms

Although various past studies have found significant positive relationships between informational subjective norms and information sufficiency (Griffin, et al., 2005), no such significant relationship was found in the current study. The hypotheses that informational subjective norms would be positively related to information seeking and systematic processing were not supported either. Oddly, the relationships found of informational subjective norms to information avoidance and heuristic processing were the exact opposite of the ones proposed in the RISP model. These norms were positively related to information avoidance ($\beta=.16$, $p \leq .05$) and heuristic processing ($\beta=.31$, $p \leq .001$). The results indicated that the more social and peer norms the participants perceived, the more likely they would intentionally avoid information about HPV and engage in more shallow processing. Past studies using RISP have not found such connections. As a matter of fact, the positive relationships of informational subjective norms to information seeking and systematic processing have been broadly tested by RISP researchers (See, for example, Lu, 2015; Yang et al., 2012; Griffin et al., 2008; Kahlor, 2007; Griffin et al., 2005).

Several reasons might explain the situation: first, the questionnaire was in English whereas all the participants came from Chinese-speaking areas. There is a possibility that these respondents failed to understand the correct meaning of the questions. That might also account more generally for the low reliabilities for the RISP model scales in this study. In addition, unknown cultural and demographic factors might have come into play somewhere during the process. For example,,

these Chinese female participants might have found seeking information about HPV useless when they believed that other people around them had enough knowledge about it. The participants were an especially specific population comparing to other studies that have been done in the past. Whether cultural and demographic factors have influenced the interaction between informational subjective norms and information seeking/processing behaviors will need to be explored in the future.

Research Question Three: Negative Affects

Negative affects, when treated separately (worry, anger, uncertainty) in the multiple regressions, were found not related to the RISP dependent variables: information insufficiency, information seeking, avoidance, systematic processing, and heuristic processing. However, in the path analyses, where the author integrated the three emotions into one negative emotion, direct relationships were found between negative affects and information seeking and systematic processing. In the RISP model, affective response is expected to influence information insufficiency, and then impact information seeking and processing indirectly. Some studies in the last few years, on the other hand, have discovered that negative affects could have a direct impact on information seeking and processing behaviors (Griffin, Dunwoody, & Yang, 2013). The current study further supported this discovery, that although a single type of negative emotion failed to cause correlation with information seeking and processing, the combination of an overall negative feeling had the capacity to do so. The results indicated that a larger amount of negative emotions one held toward the risks of HPV would lead to more effort into active

information seeking and cognitive processing. For Chinese international female students, the negative emotions they perceived about HPV were an important motivator for them to seek, gather, and understand the information about it.

However, past studies using the RISP model mostly supported the proposition about affective response and information insufficiency (see, for example, Yang & Kahlor, 2013; Griffin, et al., 2004; Lu, 2015), whereas the relationship was not found in the current study.

Drawing on the results from the multiple regressions, it can be assumed that out of the three emotions mentioned in the survey questionnaire, uncertainty had a stronger impact on information seeking and systematic processing. In the regression of negative affects and information seeking, the coefficient was only .001 for anger and .04 for worry. Although non-significant, uncertainty achieved a score of .13 in the same regression test, which explained the relationship found in the path analyses. This finding suggested that uncertainty was probably the most important emotion that motivated the students to actively seek information about HPV. Being uncertain about a specific topic is also a reflection of the lack of knowledge and information about that topic. In order to find out whether negative emotions and the level of perceived current knowledge resonated with each other, as well as other factors that might effect the negative emotions one held toward a risk, the author ran the multiple regressions using negative affects as the dependent variable.

Overall, negative emotions were also found closely related to the perceived current knowledge about HPV the participants had. Both anger (beta=.27, $p \leq .001$) and worry (beta=.14, $p \leq .05$) were positively related to current knowledge. The

RISP model maintains that past information seeking/processing behavior feeds back into the current behaviors, thus the self-reported current knowledge level was most likely based on past activities of information/processing. Therefore, the current knowledge level could have an impact on negative affects as they were reflected in the current study. In the regressions, anger showed stronger connection with current knowledge than the other two emotions. One possible explanation is the nature of sexually transmitted virus of HPV. When participants thought about the possibility of them getting infected with the virus, anger was a natural emotion raised at their sexual partners. It is also a fact that proper protection during sexual intercourse could largely reduce the possibilities of getting infected. Participants who had the knowledge of this preventive method could easily become angry with themselves, as well as their sexual partners, for the failure to properly protect themselves or be protected by the partners.

Research Question Four: Risk Judgment, Self-Efficacy, and Negative Affects

In the current study, perceived hazard characteristics included risk judgment and self-efficacy. As the RISP model proposes, risk judgment was found positively related to negative affects, which meant the more severe and likely one perceived the risks of HPV to be, the more negative emotions she held toward HPV. Fairly strong relationships were found between these variables. Beta for risk judgment and worry was .36 ($p \leq .001$), .28 for anger ($p \leq .001$), and .35 for uncertainty ($p \leq .001$). The link of risk judgment to negative emotions was broadly supported by past research using the RISP model to examine information seeking and processing

behaviors (See, for example, Yang & Kahlor, 2013; Kahlor, 2010; Griffin et al., 2008).

The path analyses also showed indirect relationships of risk judgment to information seeking and systematic processing. Risk judgment worked its way through negative affects, and then negative affects directly impacted seeking and processing behaviors. This finding is also consistent with what Lu (2015) found in his study on dietary acculturation. Rather than just applying negative emotions, Lu also examined positive emotions and found a negative relationship between positive emotions toward American diet and risk judgment about it.

In the RISP model, self-efficacy is expected to have a negative relationship to negative affects, that is, the more confidence one has to deal with a specific risk, the fewer negative emotions he or she will hold toward that risk. In the current study, self-efficacy on performing safe sex was positively related to worry ($\beta=.15, p \leq .05$). One probable scenario is that women with more sexual experience might be more confident in performing safe sex, however, these women might feel that they are more at risk. Other than the positive relationship, self-efficacy failed to cause any other significant relationships to negative affects. One possible explanation might be the lack of variance in the self-efficacy scales. The mean score for self-efficacy on performing safe sex was 3.78 ($N=173, SD=.80$), indicating that these students felt fairly confident when it came to protecting themselves by performing safe sexual behaviors. Self-efficacy on HPV vaccine, on the other hand, had the answers from only 115 participants. The small sample size might have interfered with the accuracy of the results.

Research Question Five: Age and Self-Efficacy

Significant relationship was found between the age of the participants and the self-efficacy on performing safe sex ($\beta=.27, p \leq .001$). The result implied that older participants tended to preserve more confidence about themselves performing safe sexual behaviors. Although the RISP model does not specifically point out a relationship between age and self-efficacy, the author managed to find other studies that are related to age and sexual behaviors. Young age, typically, has been associated with dangerous sexual activities and sexual transmitted diseases in a number of studies. Shipitsyna et al. (2013) found young age (15-19) to be one of the most salient predictors of sexual transmitted infections among attendees of youth clinics in St. Petersburg, Russia. McKee, Waston, and Dore (2014) conducted a qualitative study focusing on why Australian young people fail to pay attention to safe sex knowledge. The findings of that study suggest that the lack of daily life association is one of the main reasons why it is hard for adolescents to concentrate on information about safe sexual behaviors. And ultimately, it might account for the prevalence of sexual transmitted infections among young people in Australia. The current study, from the other perspective, found that age was associated with the confidence of performing safe sex. On the one hand, the finding might be a reflection of the lack of knowledge about safe sex among individuals with relatively young age; on the other hand, it might serve as an explanation of why such prevalence happens within younger population, the reason might be that the lack of the confidence of protecting selves leads them into dangerous sexual behaviors. Self-efficacy on HPV vaccine was also positively related to age ($\beta=.17, p \leq .01$), which indicates that as

age increases, the confidence one holds toward the vaccine also increases.

Theoretically, the relationship between demographic/sociological factors and self-efficacy can be further examined in detail.

Perceived Information Gathering Capacity

Although perceived information gathering capacity was not included in the research questions and hypotheses, the current study found some fascinating results about the links between capacity and informational behaviors. The study found perceived information gathering capacity to be a strong indicator of information seeking and processing behaviors. It was related to all the five dependent variables in the RISP model: information insufficiency (beta=.23, $p \leq .01$), information seeking (beta=.31, $p \leq .001$), avoidance (beta=-.20, $p \leq .01$), systematic processing (beta=.42, $p \leq .001$), and heuristic processing (beta=-.19, $p \leq .01$). The results implied that perceived information gathering capacity facilitates active information seeking and systematic processing of risk information, and diminishes intentional avoidance of information and heuristic processing of it. The strongest relationships emerged between perceived information gathering capacity and systematic processing (beta=.42, $p \leq .001$), indicating capacity greatly facilitates deeper processing, which is consistent with the results of the study by Griffin et al. (2005). The relationship between capacity and information seeking was also a strong one with the coefficient being .31 ($p \leq .001$). These results further established the fact that individuals with higher gathering capacity generally have more information options and channels available to them, thus, they are much more

encouraged to seek the information they need and cognitively process the information to distill the essence from it.

In Lu's study (2015) on dietary acculturation among Chinese international students, he also found perceived information gathering capacity to be a strong predictor of information seeking and processing behaviors. While his study supported the standpoint that capacity was strongly related to nutrition information seeking among Chinese students, the current study extended it to information seeking about HPV within the same population. Whether there was a cultural factor interfering with the results still needs to be further explored. The results also urge education practitioners to put great effort into information gathering training.

Research Question Six: Knowledge Level

One of the most important tasks of the current study is to determine the knowledge level of HPV among Chinese female international students, a unique population that faces daily impacts in various domains of life. Since HPV vaccine is undergoing clinical trial in Mainland China, no long-term campaigns about HPV targeting at female population have been launched. The review of literature above indicated a severe lack of knowledge about HPV among women in developing areas. The results of the current study indicated relatively small percentages of Chinese students who had heard of HPV (26.0%) and HPV vaccine (24.9%) before coming to the U.S. Although the portions were small, they were a significant improvement comparing to the study Tang et al. (2014) conducted at a high school in China. In that study, only 10.1% of the surveyed students had heard of HPV. The significant

improvement of knowledge about HPV might be caused by the difference of age and education level between the two studies. The multiple regression run on current knowledge and other variables demonstrated a positive relationship of age to current knowledge (beta=.17, $p \leq .01$). The older the respondents were, the more knowledge they perceived they had about HPV. This could partly explain the knowledge gap between Chinese high school students and college students. A fairly large number of the surveyed students in the current study had heard of HPV (54.5%) and HPV vaccine (56.1%). The number is higher than that in Australia, which, in the review of literature, reported the highest level of knowledge about HPV among women (51.2%). The reason for the comparatively high level of knowledge reported in the current study might be, again, due to the relatively higher level of education of the surveyed population.

Among other variables entered into the multiple regression, risk judgment was also found positively related to self-reported current knowledge level (beta=.12, $p \leq .05$). The result implied that the more severe and likely the students perceived the risks of HPV to be, the more knowledge they reported they had about them. This finding might be a result of past information seeking behaviors, as students gathered more information about HPV in the past when they considered it to be a serious risk.

Information encountering, as expected, was positively related to self-reported current knowledge level. In general, the more information the students encountered in media and healthcare organizations, the more knowledge they reported they had about HPV. However, different patterns emerged in information

encountering as media information in the U.S was positively related to knowledge level ($\beta=.28, p \leq .001$), whereas no significant relationship was found between information from healthcare organizations in the U.S and current knowledge. On the contrary, healthcare organization information encountered in China was found related ($\beta=.20, p \leq .001$). Vanslyke et al. (2008) pointed out in her study that public knowledge about HPV remained at low level until HPV vaccine entered into medicine market. The improvement of public recognition of HPV could be partly due to the media campaigns launched by the vaccine company about the links of HPV to cervical cancer. The finding in the current study is consistent with Vanslyke's view, as HPV vaccine has not been approved in China and no mass media campaign has been launched to publicize the virus. It is reasonable to assume that no students learned about HPV through traditional media channels in China. Hospitals became the best source of information about HPV. Informational channels that students used to get information in China still need to be thoroughly surveyed in the future. The result here, however, urges mass media organizations to invest efforts into HPV campaigns.

VI. Conclusion

Summary of Key Findings

First, information insufficiency was significantly related to information seeking, avoidance, systematic processing, and heuristic processing, as the RISP model proposes.

Second, no significant relationships were found between informational subjective norms and information seeking and systematic processing. Opposite relationships were found of norms to information avoidance and heuristic processing, that is, norms were positively related to the two dependent variables.

Third, no significant relationship was found between negative affect and information insufficiency. However, they were found negatively related to information seeking and systematic processing. As for perceived hazard characteristics, risk judgment was positively related to negative affects, whereas self-efficacy was not found related to them. Risk judgment, as a result, had an indirect impact on information seeking and processing behaviors. As possible results from past information seeking and processing behaviors, current knowledge was found related to negative affects.

Fourth, self-efficacy was found positively related to age, which meant that older students had more confidence in protecting selves by getting vaccinated and performing safe sexual behaviors.

Fifth, Chinese female college students in the United States displayed a fairly high knowledge level about HPV. However, most of them got the knowledge after coming to the U.S, which implied poor HPV education and popularization in China.

The results also showed a relatively low vaccination rate among these students, which urged intensive effort into the popularization of HPV vaccine.

Theoretical Contributions

The current study further expanded the RISP model into the domain of sexually transmitted viruses, which is a private interpersonal risk. Direct relationships were found between negative emotions and information seeking/processing behaviors. Specific correlation between demographic factors and perceived hazard characteristics was found (age and self-efficacy). The result can be used to refine the model in detail. Patterns within the interaction between current knowledge and negative emotions demonstrated the past reflection of information seeking/processing behaviors on the current ones.

Practical Contributions

For health educators in China, the current study indicated poor HPV education and popularization in China and urged more efforts into sex education in high schools and colleges.

For campaign designers both in China and the U.S, the connection between negative emotions and active information seeking and systematic processing provided ideas for designing effective campaigns about HPV. The major connection between negative emotions and information seeking/processing came from uncertainty. Targeting at generating uncertainty among women in HPV campaigns might lead to more effective results. For healthcare workers in colleges and

universities, the study indicated a stronger need to publicize HPV to international students, especially those who come from less-developed countries and areas. The low rate of HPV vaccination among Chinese female students in the U.S implied a huge potential market for vaccine manufacturers and distributors in the U.S.

Limitations and Future Research

As a tentative attempt of figuring out the sociological and cognitive factors effecting the information seeking and processing about HPV among Chinese female international students in the United States, the current study faced difficulties during its instrumentation and limitations to its results.

First, due to time and budget constraint, the current study collected a convenience sample rather than a probability sample. The method of recruiting participants might have led to biases and limitations of the sample itself. Using internet as a recruitment channel might have interfered with the knowledge level of the students, since most students who used QQ were frequent internet users and there was a great possibility that they might encounter information about HPV on the internet. Thus, this study only focused on a small fraction of Chinese international students, and as a result, was not representative enough to encompass the results to all Chinese female international students in the U.S. Additionally, the sample was of 173 individuals, which was a relatively small sample for quantitative research. The small sample might have led to inaccurate and unrepresentative results.

Second, language has been an issue during the instrumentation of the survey. Although all the participants originally came from Chinese-speaking areas, to achieve the maximum accuracy of the variables tested, the questionnaire was written in English. No participants reported difficulties in understanding the questionnaire, however, it was apparent that some of them lost patience during the process. The possibility that some respondents misunderstood some of the questions cannot be ruled out.

Third, for efficiency issues, the current study omitted some of the important predictors in the RISP model such as previous hazard behaviors. Questions about the information channels the students used to gather information about HPV were not asked. The omission of certain questions might have resulted in a lack of comprehensiveness and control for these variables.

Future research should consider cultural impact and differences as a predictor of information seeking and processing behaviors. Additionally, larger probability sample should be obtained for future studies. When conducting intercultural studies, future researchers should consider bilingual questionnaires rather than just use a single language.

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APPENDICES

Appendix A: Tables

Descriptive Statistics				
Question	Item	N	Mean	Standard Deviation
3	Perceived Importance	173	6.76	2.96
3a	Sufficiency (Know a lot now)	173	2.69	1.13
3b	Sufficiency (Know how to prevent)	173	2.70	1.13
3c	Insufficiency (Require a lot of information)	173	3.46	1.05
3d	Insufficiency (Need to know)	173	3.83	.96
3e	Insufficiency (Not know enough)	173	3.55	.97
3f	Sufficiency (Meets need)	173	2.69	1.05
4	Current Knowledge	173	42.72	26.51
5	Sufficiency Threshold	173	75.14	22.00
6	InfoSeeking (Learn more)	173	4.02	.75
8	Anticipated Outcome (Certainty)	173	4.14	.62
9	Avoidance (Know enough)	173	2.54	.97
10	Heuristics (No time)	173	2.91	1.00
11	InfoSeeking (Daily life)	173	3.71	.75
12	Heuristics (Few points)	173	3.18	.89
13	Anticipated Outcome (Anger)	173	2.91	.91
14	InfoSeeking (Out of way)	173	3.50	.80
16	SysProc (Applies daily life)	173	3.86	.74
17	Avoidance (Waste of time)	173	2.20	.88
19	Anticipated Outcome (At ease)	173	3.65	.79
20	SysProc (Broad understanding)	173	3.71	.72
21	Heuristics (Personal need)	173	3.35	.82
22	SysProc (More viewpoints)	173	3.81	.70
23	Avoidance (Avoid)	173	2.36	.97
24	Anticipated Outcome (Worry)	173	3.23	.90
25	DesNorms (Most Women)	173	2.95	.95
26	DesNorms (Most CN students)	173	2.78	.93
27	InjNorms (Important people)	173	3.40	.82
28	Risk Seriousness	173	73.52	25.38
29	Probability	173	28.81	25.32
33	PerGatherCap (Where)	173	3.66	.86
35	PerGatherCap (Separate)	173	3.50	.80
36	PerGatherCap (Make sense)	173	3.75	.69
37	PerGatherCap (Experts)	173	3.49	.78
38	PerGatherCap (Additional)	173	3.62	.77
39	Affect (Worry)	173	5.03	2.89
40	Affect (Anger)	173	3.82	2.90
41	Affect (Uncertainty)	173	5.03	2.74
42	Self Efficacy (Safe sex)	173	3.76	.86
43	Self Efficacy (Believe safes sex)	173	3.80	.89
47	Vaccine Access	115	3.10	.99
48	Vaccine Cost	115	3.30	.81
49	Easy to get Vaccinated	115	3.29	.75
50	Vaccine (Good protection)	173	3.87	.79
51	Traditional Media (US)	173	2.14	.81
52	Traditional Media (Before US)	173	1.90	.78
53	Media (Health Orgs US)	173	2.65	.95
54	Media (Health Orgs before US)	173	2.91	.78
57	Age	162	22.98	1.79

Frequencies

Heard of HPV		
	Frequency	Percent
Yes	99	57.2
No or Not Sure	74	42.8
Total	173	100.0
Heard of HPV Before Came to the U.S		
Yes	45	45.5
No or Not Sure	54	54.5
Total	99	100.0
Missing	74	
Heard of HPV Vaccine		
Yes	98	56.6
No or Not Sure	75	43.4
Total	173	100.0
Heard of HPV Vaccine Before Came to the U.S		
Yes	43	43.9
No or Not Sure	55	56.1
Total	98	100.0
Missing	75	
Vaccination History		
Yes	58	59.2
No	40	40.8
Total	98	100.0
Missing	75	
Place of Vaccination		
United States	66	40.7
Mainland China	4	2.5
Hong Kong/Macau	1	.6
Other	5	3.1
Not Applicable	86	53.1
Total	162	100.0
Missing	11	
Knowledge of Connection to Genital Warts		
Yes	79	45.7
No or Not Sure	94	54.3
Total	173	100.0
Knowledge of Connection to Cancers		
Yes	96	55.5
No or Not Sure	77	44.5
Total	173	100.0

HPV increases a woman's risk of cervical cancer.		
	Frequency	Percent
True	129	74.6
False or Don't Know	44	25.4
Total	173	100.0
Men can be affected by HPV.		
True	119	68.8
False or Don't Know	54	31.2
Total	173	100.0
HPV increase a woman's risk of genital warts.		
True	132	76.3
False or Don't Know	41	23.7
Total	173	100.0
Region		
Mainland China	158	97.5
Hong Kong	2	1.2
Macau	2	1.2
Total	162	100.0
Missing	11	
Year in School		
Freshman	10	6.2
Sophomore	15	9.3
Junior	20	12.3
Senior	21	13.0
Graduate (Master)	87	53.7
Graduate (Doctoral)	9	5.6
Total	162	100.0
Missing	11	

Information Processing Factor Analysis

Processing Styles	Items	Factor 1	Factor 2	Factor 3	Initial Eigenvalues			Rotation Sum of Squared Loadings		
					F1	F2	F3	F1	F2	F3
Systematic Processing	After thinking about information on this topic, I have a broader understanding.	.75	-.07	-.14	F1	F2	F3	F1	F2	F3
	It is important for me to interpret information about the risks of HPV in a way that applies directly to my life.	.69	.03	-.21	1.76	1.58	1.13	1.74	1.44	1.29
	If I need to act on preventing HPV, the more viewpoints I get the better.	.65	-.04	.27						
	When this topic comes up, I'm likely to stop and think about it.	.19	-.03	-.21						
Heuristic Processing	When this topic comes up, I rarely spend much time thinking about it.	-.27	.68	.22						
	When I encounter information about HPV, I focus on only a few key points.	-.10	.73	-.34						
	There is far more information on this topic than I personally need.	.34	.50	.34						
	If I need to act on preventing HPV, the advice of one expert is enough for me.	.27	.50	-.34						

Information Processing Factor Analysis (Three items excluded)

Processing Styles	Items	Sys	Heu	Initial Eigenvalues		Rotation Sum of Squared Loadings		Reliability
				Sys	Heu	Sys	Heu	
Systematic Processing	After thinking about information on this topic, I have a broader understanding.	.82	-.01	Sys	Heu	Sys	Heu	
	It is important for me to interpret information about the risks of HPV in a way that applies directly to my life.	.71	-.06	1.7	1.2	1.6	1.3	.56
	If I need to act on preventing HPV, the more viewpoints I get the better.	.64	-.10	2	3	1	3	
Heuristic Processing	When this topic comes up, I rarely spend much time thinking about it.	-.17	.79					.50
	When I encounter information about HPV, I focus on only a few key points.	.03	.84					

Information Seeking Factor Analysis

Items	Factor Loading	Initial Eigenvalues	Reliability
When the topic of HPV comes up, I try to learn more about it.	.71	1.41	.43
When this topic comes up, I'm likely to go out of my way to get more information.	.68	.82	
When it comes to the topic of HPV, I'm content to let information come to me in the course of my daily life.	.68	.78	

Information Avoidance Factor Analysis

Items	Factor 1	Factor 2	Initial Eigenvalues		Rotation Sum of Squared Loadings		Reliability
When the topic of HPV comes up, I'm likely to tune it out.	.46	.75	Factor 1	Factor 2	Factor or1	Factor or2	.48
What I know about this topic is enough.	.49	-.69	1.65	1.05	1.62	1.08	
Gathering a lot of information about HPV is a waste of time.	.71	-.07					
Whenever the topic of HPV comes up, I go out of my way to avoid learning more about it.	.84	.05					

Perceived Information Gathering Capacity Factor Analysis

Items	Factor1	Factor2	Initial Egenvalues		Rotation Sum of Squared Loadings		Reliability
I would know where to go for information I could rely on.	.67	.13	Factor 1	Factor 2	Factor1	Factor2	.72
It is hard for me to get useful information about this topic. (Reversed Coded)	.15	.97	2.85	1.02	2.83	1.04	
I would know how to separate fact from fiction.	.72	-.09					
I am able to get and make sense of information on this topic.	.85	.05					
I would know what questions to ask the experts.	.77	-.04					
I could readily take the time to gather any additional information I might need.	.75	-.24					

Self-Efficacy (Safe Sex) Factor Analysis

Items	Factor Loading	Initial Egenvalues	Reliability
I believe that practicing safe sex would protect me against the virus.	.91	1.67	.80
In my life, it would be easy for me to perform safe sex to avoid getting infected with HPV.	.91		

Self-Efficacy (Vaccine) Factor Analysis

Items	Factor Loading	Initial Egenvalues	Reliability
I have access to HPV vaccination.	.75	2.28	.72
HPV vaccine is affordable to me.	.87		
It would be easy for me to get vaccinated against HPV.	.86		
I believe that HPV vaccination is good protection for me against the virus.	.47		

Informational Subjective Norms Factor Analysis

Items	Factor Loading	Initial Eigenvalues	Reliability
Most of other Chinese female college students in the U.S stay informed about the risks of getting infected with HPV.	.77	1.71	.62
Most people who are important to me think that I should stay informed about the risks of HPV and the preventive techniques.	.71		
Most women who are important to me stay informed about the risks of getting infected with HPV.	.78		

Summated Scales

Scale	N	Mean	Standard Deviation	Cronbach's Alpha
Information Seeking	173	3.74	.53	.43
Information Avoidance	173	2.37	.68	.52
Systematic Processing	173	3.79	.52	.56
Heuristic Processing	173	3.05	.77	.50
Informational Subjective Norms	173	3.04	.68	.62
Descriptive Norms	173	2.86	.79	.60
Self-Efficacy Overall	115	3.45	.57	.73
Self-Efficacy Safe Sex	173	3.78	.80	.80
Self-Efficacy Vaccine	115	3.33	.62	.72
Perceived Information Gathering Capacity	173	3.60	.58	.80
Negative Affect	173	4.62	2.30	.73
Risk Judgment	173	2116.06	2089.76	N/A

Appendix B: Survey Questionnaire

Risk Information Seeking and Processing Among Chinese Female College Students in the United States

PRINCIPAL INVESTIGATOR: Shiyao Li (414)-324-9442, E-mail: shiyao.li@marquette.edu

PURPOSE OF THE STUDY: The purpose of this survey research is to find out what native Chinese female college students studying in the United States think about potential risks to their health and to the health of other women, and what information, if any, they would like about these risks.

PROCEDURES: If you are a Chinese female student, who is between the ages of 18-26, you will be asked a series of questions regarding some possible risks to your health. **For purpose of this study, a Chinese student is defined as someone who was born in China and is currently enrolled in an undergraduate or graduate program of study in the United States.**

DURATION: Your participation will consist of one survey completed online taking approximately 20 minutes.

BENEFITS: **There will be four Amazon gift cards, each worth \$50, distributing to randomly selected respondents.** After you finish the survey, you will be asked to provide contact information to receive the gift card. The contact information you provide will be completely separated from the survey, which means your answers are still anonymous. By finishing this survey, you will also help health organizations and research institutes better understand the views of Chinese female students toward HPV and the information available to them.

RISKS: The risks associated with participation in this study include being asked some questions that may make you feel uncomfortable.

CONFIDENTIALITY: All information you reveal in this study will be kept confidential. When the results of the study are published, you will not be identified by name. Results will be analyzed and published only as aggregate data. E-mail addresses of chosen respondents will be tracked only for the purpose of sending rewards; the addresses will be kept confidential.

VOLUNTARY NATURE OF PARTICIPATION: Participating in this study is completely voluntary.

CONTACT INFORMATION: If you have any further questions about the study, please contact the principal investigator Shiyao Li by phone at (414)-324-9442, or

by e-mail at shiyao.li@marquette.edu. If you have any further questions about your rights as a research participant, please contact Marquette University's Office of Research Compliance at (414)-288-7570 or orc@marquette.edu.

By clicking on the "I Agree" button below, you indicate that **you have read this consent form, are a Chinese female student between the ages of 18-26 in a U.S university, and voluntarily consent to participate.** Your answers are very important. The anonymous results will be used for a thesis and for papers and publications.

If you decline to participate, or do not qualify as a female Chinese student studying in the United States, please exit the survey.

Agree

Screening question:

Are you a **native Chinese female student studying in a U.S university** who is between the **ages of 18-26**?

[IF NO, skip to the end of the survey]

We would like to ask you some questions about Human Papillomavirus (HPV, 人类乳头瘤病毒).

1. Had you ever heard of HPV (Human Papillomavirus) before encountering this survey?

Yes/No/Not sure

[IF YES, ask Q2 below]

2. Had you heard of HPV before you came to the United States?

Yes/No/Not sure

Please read the following statement before answering the survey questions.

HPV (Human Papillomavirus) is a widespread, but preventable, sexually transmitted disease caused by a virus.

It is important that you answer the questions that follow based simply on what you currently know about HPV. Please do not gather any other information (for example, from an Internet search) about HPV while you are completing this questionnaire. Thank you.

3. We'd like to know how important this matter is to you. Please use a scale from zero to 10, where zero means no importance at all and 10 means that it is as important as anything could ever be to you. How important to you is the possibility of getting infected with HPV?

Please estimate (Fill-in): _____

Please indicate how much you agree or disagree with the following statements regarding your knowledge about the possible risks to you from HPV.

3a. I know a lot about HPV at the moment.
Strongly disagree 1 2 3 4 5 Strongly agree

3b. I know how to prevent HPV.
Strongly disagree 1 2 3 4 5 Strongly agree

3c. I require a lot of information to judge the risks I might be exposed to.
Strongly disagree 1 2 3 4 5 Strongly agree

3d. I need to know everything I can about risks from HPV.
Strongly disagree 1 2 3 4 5 Strongly agree

3e. I don't know enough to judge how much I am at risk.
Strongly disagree 1 2 3 4 5 Strongly agree

3f. The knowledge I have at this time meets all of my needs for dealing with the possible risks in my life from HPV.
Strongly disagree 1 2 3 4 5 Strongly agree

Please estimate the amount of knowledge you currently have about the possible risks to you from HPV. Then estimate the ideal amount of knowledge you would like to have to deal adequately with this risk in your life.

Please use the following scale:

0 = knowing nothing about the risk to you from HPV

100 = knowing everything you could possibly know about that risk

You can fill out any number between zero and 100 that best matches your estimate. For example, some people might estimate 30 as what they currently know, but believe that 75 would represent the ideal amount of information they would like to have. They would then put 30 on the first line and 75 on the second line below. Others might think that what they know now (if 30) is sufficient for them to deal with the risk, and put 30 on the second line below as well.

4. How much knowledge do you think you currently have?

Please estimate (Fill-in): _____

5. How much knowledge do you think you need to deal adequately with the risk of HPV in your life?

Please estimate (Fill-in): _____

The next questions are about how you get and think about information you run across in the mass media, Internet, and elsewhere. Given the limit on time in a day, people have to make choices about what information to devote their time and attention to. The following statements are statements that some people have made about how they personally deal with information about the risk of getting infected with HPV and about prevention techniques. Please indicate whether you strongly disagree, disagree, feel neutral, agree or strongly agree with them.

6. When the topic of HPV comes up, I try to learn more about it.
Strongly disagree 1 2 3 4 5 Strongly agree

7. When the topic of HPV comes up, I'm likely to tune it out.
Strongly disagree 1 2 3 4 5 Strongly agree

8. If I were to get more information about HPV, I would become more certain about the risks to me.
Strongly disagree 1 2 3 4 5 Strongly agree

9. What I know about this topic is enough.
Strongly disagree 1 2 3 4 5 Strongly agree

10. When this topic comes up, I rarely spend much time thinking about it.
Strongly disagree 1 2 3 4 5 Strongly agree

11. When it comes to the topic of HPV, I'm content to let information come to me in the course of my daily life.
Strongly disagree 1 2 3 4 5 Strongly agree

12. When I encounter information about HPV, I focus on only a few key points.
Strongly disagree 1 2 3 4 5 Strongly agree

13. If I were to get more information about HPV, I would become more angry about the risks to me.
Strongly disagree 1 2 3 4 5 Strongly agree

14. When this topic comes up, I'm likely to go out of my way to get more information.
Strongly disagree 1 2 3 4 5 Strongly agree

15. If I need to act on preventing HPV, the advice of one expert is enough for me.
Strongly disagree 1 2 3 4 5 Strongly agree

16. It is important for me to interpret information about the risks of HPV in a way that applies directly to my life.

Strongly disagree 1 2 3 4 5 Strongly agree

17. Gathering a lot of information about HPV is a waste of time.

Strongly disagree 1 2 3 4 5 Strongly agree

18. When this topic comes up, I'm likely to stop and think about it.

Strongly disagree 1 2 3 4 5 Strongly agree

19. If I were to get more information about HPV, I would become more at ease about the risks to me.

Strongly disagree 1 2 3 4 5 Strongly agree

20. After thinking about information on this topic, I have a broader understanding.

Strongly disagree 1 2 3 4 5 Strongly agree

21. There is far more information on this topic than I personally need.

Strongly disagree 1 2 3 4 5 Strongly agree

22. If I need to act on preventing HPV, the more viewpoints I get the better.

Strongly disagree 1 2 3 4 5 Strongly agree

23. Whenever the topic of HPV comes up, I go out of my way to avoid learning more about it.

Strongly disagree 1 2 3 4 5 Strongly agree

24. If I were to get more information about HPV, I would become more worried about the risks to me.

Strongly disagree 1 2 3 4 5 Strongly agree

The following statements concern what you believe to be others' opinions about HPV. Please indicate whether you strongly disagree, disagree, feel neutral, agree or strongly agree with them.

25. Most women who are important to me stay informed about the risks of getting infected with HPV.

Strongly disagree 1 2 3 4 5 Strongly agree

26. Most of other Chinese female college students in the U.S stay informed about the risks of getting infected with HPV.

Strongly disagree 1 2 3 4 5 Strongly agree

27. Most people who are important to me think that I should stay informed about the risks of HPV and the preventive techniques.

Strongly disagree 1 2 3 4 5 Strongly agree

28. If you were to be infected with HPV, how serious do you think it would be?

Please use a scale from zero to 100, where zero means it is not at all serious, and 100 means it is as serious as it could possibly be.

Please estimate (Fill-in): _____

29. In your estimation, how likely is it that you would become infected with HPV?

Please use a scale from zero to 100, where zero means that you would have absolutely no chance whatsoever of being infected, and 100 means that you are certain to.

Please estimate (Fill-in): _____

Please answer the following questions about HPV to the best of your knowledge.

30. HPV virus can increase a woman's risk of cervical cancer.

True/False/DK

31. Men can be infected by the HPV virus.

True/False/DK

32. HPV virus can increase a woman's risk of genital warts.

True/False/DK

The following are statements that people have made about their own ability to get and make sense of information from the mass media, Internet, government agencies, universities and other sources regarding the risk of HPV. To what extent do you agree with these statements?

If I wanted to get information about the risk of HPV...

33. I would know where to go for information I could rely on.
Strongly disagree 1 2 3 4 5 Strongly agree

34. It is hard for me to get useful information about this topic.
Strongly disagree 1 2 3 4 5 Strongly agree

35. I would know how to separate fact from fiction.
Strongly disagree 1 2 3 4 5 Strongly agree

36. I am able to get and make sense of information on this topic.

Strongly disagree 1 2 3 4 5 Strongly agree

37. I would know what questions to ask the experts.

Strongly disagree 1 2 3 4 5 Strongly agree

38. I could readily take the time to gather any additional information I might need.

Strongly disagree 1 2 3 4 5 strongly agree

Negative Emotions

Now we'd like to know your feelings about the risk of getting infected with HPV. Please use a scale from zero to 10, where zero means you have "none of this feeling" and 10 means you have "a lot of this feeling." When you think about the possible consequences posed to you by getting infected with HPV...

39. How much worry do you have?

None 0 1 2 3 4 5 6 7 8 9 10 A Lot

40. How much anger do you have?

None 0 1 2 3 4 5 6 7 8 9 10 A Lot

41. How much uncertainty do you have?

None 0 1 2 3 4 5 6 7 8 9 10 A Lot

The following statements are about your ability to prevent yourself from getting infected with HPV.

42. I believe that practicing safe sex would protect me against the virus.

Strongly disagree 1 2 3 4 5 Strongly agree

43. In my life, it would be easy for me to perform safe sex to avoid getting infected with HPV.

Strongly disagree 1 2 3 4 5 Strongly agree

44. A vaccine exists that protects against HPV. Had you ever heard of HPV vaccine before encountering this survey?

Yes/No/not sure

[IF YES, ask Q45 and Q46 below. Otherwise skip to Q47]

45. Had you heard of HPV vaccine before you came to the United States?
Yes/No/not sure

46. Have you received HPV vaccination?
Yes/No/not sure

To what extent do you agree with the following?

[IF YES to Q44, skip Q45-47 and go to Q48.]

47. I have access to HPV vaccination.
Strongly disagree 1 2 3 4 5 Strongly agree

48. HPV vaccine is affordable to me.
Strongly agree 1 2 3 4 5 Strongly disagree

49. It would be easy for me to get vaccinated against HPV.
Strongly agree 1 2 3 4 5 Strongly disagree

50. I believe that HPV vaccination is good protection for me against the virus.
Strongly agree 1 2 3 4 5 Strongly disagree

The following statements ask about the extent to which you may have encountered information about HPV before

51. How often have you seen information about HPV or HPV vaccine in newspapers, on TV or radio in the United States?

Never Rarely Sometimes Frequently

52. How often had you seen information about HPV or HPV vaccine in newspapers, on TV or radio before you came to the United States?

Never Rarely Sometimes Frequently

53. Have you ever received pamphlets about HPV or HPV vaccine handed out by hospitals, health providers, or health organizations in the United States?
Yes, once / Yes, more than once/ No / Not sure.

54. Had you ever received pamphlets about HPV or HPV vaccine handed out by hospitals, health providers, or health organizations before you came to the United States?
Yes, once / Yes, more than once/ No / Not sure.

55. Were you aware of the connection between HPV and cancer prior to taking this survey?

Yes/No/Not sure

56. Were you aware of the connection between HPV and genital warts prior to taking this survey?

Yes/No/Not sure

57. What is your age?

58. Which year of college are you in? If you are in graduate school, please indicate your level of graduate study.

Freshman

Sophomore

Junior

Senior

Graduate (Master)

Graduate (Doctoral)

59. Are you from Mainland China or Hong Kong/Macau Special Administrative Regions?

Mainland

Hong Kong

Macau

60. If you have received HPV vaccination, please indicate where you received the vaccination.

United States

Mainland China

Hong Kong/Macau

Other

Not Applicable (i.e., never received HPV vaccination)

Appendix C: Recruitment Letter

Hi!

My name is Shiyao Li. I am a second-year graduate student in College of Communication, Marquette University, Milwaukee, WI.

I would like to invite you to participate in a study as part of my master's degree requirement. The study is about the information seeking and processing behaviors among Chinese female students who study in a U.S university about certain health issues.

You will be asked to complete a survey which will take approximately 15-20 minutes. All of your answers will be completely anonymous.

After finishing the survey, you will have a chance to win a \$50 Amazon gift card. The recipients of the gift cards will be randomly selected after all participants have finished the survey.

If you would like to participate, please be sure to carefully read the consent form and click on the "Agree" button at the end of the first page of the survey.

Please use this link to enter the survey:

https://marquette.az1.qualtrics.com//SE/?SID=SV_6RTYgSZgFOWJgQR

Best,
Shiyao