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Dimensions of Prior Knowledge: Implications for Health Information-seeking and Disease Prevention Behaviors

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Dedicated to my wonderful parents!

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Dimensions of Prior Knowledge: Implications for Health Information-seeking and Disease Prevention Behaviors

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Abstract

Consumer behavior has long suggested the importance of prior knowledge in understanding behavior. In spite of the vast amount of research in this area, there is a vacuum regarding to what extent an individual applies his/her knowledge in decision-making situations (a concept from economic psychology). An individual may have the knowledge but might not use it or apply it when making decisions. This is of great importance, especially within a health context where decisions may result in life or death situations. In addition, operationalizations of dimensions of prior knowledge within the consumer behavior field have been inconsistent.

To eliminate these gaps in prior research and extend the consumer behavior literature this dissertation draws upon the consumer behavior and economic-psychology literatures to investigate the impact of six dimensions of prior knowledge on health information-seeking and disease prevention behaviors. The case of HPV is used here to examine the theoretical relationships. This dissertation is also of particular interest to

better understanding direct-to-consumer (DTC) advertising. DTC advertising usually provides information to consumers through the listing of sources consumers can go to, other than providing disease prevention information within the message itself. Hence, examining how prior knowledge impacts information-seeking and prevention behaviors can help guide the development of more effective DTC messages.

Results show that information-seeking intentions are predicted by how much consumers think they know and how much of their knowledge they apply in decision-making situations. Also, consumers who have high confidence in using their knowledge are more likely to use external (as opposed to internal) sources of information. In addition, prevention behaviors are predicted by how much consumers know about the disease, how much they think they know and their experience with the disease.

This investigation helps guide the development of future DTC campaigns, in terms of motivating consumers to seek additional information, and take the recommended preventative actions; based on consumers' prior knowledge set. In conclusion, this dissertation extends the literature on the role of prior knowledge in consumer decision-making on multiple levels and provides interesting findings for future research.

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Chapter One: Introduction

The importance of prior knowledge as a component of human capital has long been recognized and investigated in consumer behavior. (Bettman & Park, 1980; Rudell, 1979; Alba, 1983; Johnson & Russo, 1994; Brucks, 1985; Moorman et al. 2004; Carlson et al., 2009; Manika & Golden, 2010). Yet, many have called for further research (e.g., Brucks, 1985; Carlson et al., 2009). Researchers have lacked consistency in how they conceptualize and operationalize different dimensions of prior knowledge (e.g., Objective, Subjective), making it difficult for them to build upon previous work when developing theories (Brucks 1985). Recent studies have tried to reduce these inconsistencies within the consumer behavior field by employing Brucks' (1985) knowledge definitions (see Raju, Lonial, & Mangold, 1995; Moorman et al., 2004; Carlson et al., 2009). The operationalization of these dimensions of prior knowledge has still remained somewhat inconsistent.

In addition, there is a vacuum regarding to what extent an individual takes his/her knowledge into account when making decisions (a concept from economic psychology). "*People's judgments and decisions are typically based on only a small subset of the knowledge they could potentially apply*" (Wyer, 2008, p.31). That means that an individual may have the knowledge but might not use it or apply it in decision-making situations. This is of importance, especially within a health context (where decisions may result in life or death situations). Limited research has examined prior knowledge within a health context, other than nutrition (see Carlson et al. 2009, Table 2, p. 869).

To address the conceptual and operational inconsistencies of prior knowledge dimensions in consumer behavior, and the vacuum regarding to what extent an individual takes his/her knowledge under consideration when making decisions, this study draws upon the consumer behavior and economic psychology fields to propose six dimensions of prior knowledge. Further, this study investigates the impact of these six dimensions of prior knowledge within a health-context. Brucks, Mitchell and Staelin (1984), have long suggested that future research should investigate the impact of the different prior knowledge conceptualizations on the information acquisition and decision-making process. Thus, each of the suggested dimensions of prior knowledge is examined in terms of its impact on health information-seeking and disease prevention behaviors.

The relationship between prior knowledge and information-seeking behaviors has been examined across a range of topics (e.g., automobiles, microwaves, nutrition, etc.), in the consumer behavior field, with varying results (e.g., Moore & Lehman, 1980; Johnson & Russo, 1984; Brucks, 1985; Raju, Lonial, & Mangold, 1995). Most consumer behavior studies usually measure information-seeking in terms of past information-seeking behaviors. To broaden this area of research within the consumer behavior field, the present study uses information-seeking intentions as a measure of information-seeking.

Based on the information-seeking literature, many information-seeking models have also identified prior knowledge as an important determinant of information-seeking, but have mostly focused on the effect of one dimension of prior knowledge (how much one thinks he or she knows). Therefore, examining how the six dimensions of prior knowledge, proposed by the present study, impact information seeking intentions, will

advances both information-seeking and consumer behavior literatures, in terms of the relationship between prior knowledge and information-seeking.

Most direct-to-consumer (DTC) advertisements provide information to consumers through the listing of sources consumers can go to for more information (i.e., refer to a physician, ask your doctor, or visit website to determine whether this drug is for you), other than the message itself. Therefore, understanding how an individual receives and seeks health-related information, based on his/her full prior knowledge set (including all six proposed dimensions of prior knowledge), is vital in an era where consumers are surrounded by information clutter.

The present study also investigates information-seeking at multiple levels: the interpersonal (external), intrapersonal (internal), and mass-mediated (external) level. By identifying the preferred sources of health-related information, health communicators can design more effective direct-to-consumer (DTC) messages, by recommending to consumers an information source that they are more likely to use.

In addition, consumers' prior knowledge can be used as a market segmentation technique, as the presentation of the product or health-related information needs to correspond and be associated with consumers' prior knowledge. This would increase the fluency and ease of product or prevention measure evaluations and result in positive decision-making. This understanding can provide health communicators with insights on how to target consumers more effectively through DTC advertising and how to persuade them to engage in the recommended preventative actions.

Further, the activity of seeking information can also be viewed "*as one step in health behavior change, but more focused on the decision-making steps*" (Freimuth, Stein, and Kean, 1989, p.6), which is why it is common for researchers to treat information-seeking behaviors as a type of prevention behaviors (cf., Glanz et al., 2008). An additional contribution to the present study will be the examination of the differences, if any, between information-seeking and disease prevention behavior intentions, in terms of how prior knowledge impacts them. This investigation is also the first study to examine the relationship between prior knowledge and disease prevention behaviors, in the consumer behavior field.

Thus, the present study examines three research questions:

RQ1: What are the differential effects of the proposed dimensions of prior knowledge on health information-seeking intentions?

RQ2: What are the differential effects of the proposed dimensions of prior knowledge on disease prevention behavioral intentions?

RQ3: What are an individual's preferred sources of health-related information, based on an individual's prior knowledge set?

The case of HPV and associated behavioral responses (e.g. getting vaccinated with the HPV vaccine) were selected as the vehicle disease for the present study because of the potential relevance of prior knowledge to the consumers' health prevention decision-making. The HPV vaccine is the first STD and cancer prevention vaccine (Abramoff, 2007) and is also relevant here because it has been extensively promoted via DTC advertising messages since its introduction to the public.

To provide a theoretical and empirical background for the primary construct addressed in the previously stated research questions, a summary of the literature on the

prior knowledge construct, based on both the consumer behavior and economic psychology fields, is presented (Chapter Two). In addition, Chapter Three focuses on prior consumer behavior and information-seeking research findings regarding the relationship between prior knowledge and health information-seeking. A discussion on disease prevention behaviors (the second dependent variable in this study) and DTC advertising is also presented in Chapter Three. The literature review (Chapter Two & Three) is used to support the development of the proposed hypotheses, which are described and justified in Chapter Four. Chapter Five delineates the research methodology used in this study, comprised of an online Internet survey and preceded by a pretest. Data analyses procedures and results can be found in Chapter Six, followed by the discussion of the results in Chapter Seven. Lastly, Chapter Eight discusses the implications, and limitations of the results, as well as future research directions. Appendices include: the original questionnaire used for pretest data collection (Appendix A); followed by the resulting questionnaire used for the main study data collection (Appendix B); the answers to the HPV knowledge test score section of the questionnaire, verified by a health professional (Appendix C); and lastly a post hoc regression analysis of the results (Appendix D).

Chapter Two: The Prior Knowledge Construct

This chapter provides an overview of the prior knowledge construct as it has been defined and studied within the consumer behavior and economic psychology fields. The conceptual and operational differences between and within the two fields in regards to the prior knowledge construct are identified. Based on the consumer behavior and economic psychology's conceptualizations of prior knowledge the present study proposes six dimensions of prior knowledge, which are also discussed in this chapter.

The prior knowledge construct, also called *topic knowledge*, or *product knowledge* refers to an individual's knowledge of a topic or product. One of the most recent consumer behavior prior knowledge studies was conducted by Carlson et al. in 2009. In his meta-analysis of fifty-one prior knowledge studies, published between 1979 and 2007, Carlson et al. (2009) explored the correlation between consumers' perceptions of how much they know and how they perform on an actual stored knowledge test (this correlation examined is called knowledge calibration). Carlson's et al. (2009) study underscores the large amount of research that exists in this area, showing the relevance of prior knowledge for understanding consumer behavior.

Consumer behavior literature distinguishes among three dimensions of prior knowledge: knowledge stored in memory, how much an individuals thinks he/she knows, and knowledge acquired from experience (Brucks, 1985; Raju, Lonial & Mangold, 1995). However, there is a vacuum regarding to what extent an individual takes his/her knowledge under consideration when making decisions. Knowledge of any dimension can exist and not be used or seen as applying to the self. This notion comes from

economic psychology, which also distinguishes among three different dimensions of prior topic-related knowledge. The economic-psychology's conceptualizations of prior knowledge dimensions differ greatly from those of consumer behavior researchers.

In addition, within the consumer behavior field, the different ways that the prior knowledge construct has been conceptualized and operationalized makes it difficult for researchers to build upon previous work when developing theories (Brucks, 1985; Park, Mothersbaugh, and Feick, 1994; Cole et al., 1991; Spreng and Olshavsky, 1990). Six dimensions of prior knowledge are proposed in an effort to reduce these inconsistencies among (and within) the consumer behavior and economic psychology fields, in an effort to provide a theoretical framework of prior knowledge, which can be used in future research.

2.1. THE CONSUMER BEHAVIOR PERSPECTIVE ON PRIOR KNOWLEDGE

Consumer behavior researchers often differentiate between knowledge stored in consumers' memory and consumers' assessment of their knowledge, employing the term *objective knowledge* to refer to what is actually stored in memory and *subjective knowledge* to refer to what consumers perceive they know (Brucks, 1985). This distinction is important, as consumers might think they know more than they actually do, which has been found to have an impact on their behavior (Alba & Hutchinson, 2000).

According to Brucks (1985), there is a conceptual difference between objective knowledge and subjective knowledge. Subjective knowledge is said to include an individual's level of confidence in his/her knowledge, while objective knowledge refers only to what the consumer actually knows (Bruck, 1985). "Miscalibration" refers to the difference between objective knowledge and subjective knowledge (Alba & Hutchinson,

2000). According to Moorman et al., (2004), objective and subjective knowledge are unique constructs with unique measures (Park, Motherbaugh, & Feik, 1994); they have unique influences (Bettman & Park, 1980; Brucks, 1985; Rudell, 1979; Moorman et al. 2004), unique antecedents (Park, Mothersbaugh, & Feik, 1994) and varying correlations (Raju, Lonial, & Mangold, 1995; Carlson et al. 2009).

In addition to objective and subjective knowledge, some researchers consider usage experience to be a different dimension of prior knowledge (Raju, Lonial & Mangold, 1995). "Usage experience" refers to whether or not an individual has used, owned, or searched for information about a product. It is considered a different dimension of prior knowledge because "*a certain type of knowledge does accrue with continued usage of a product*" (Raju, Lonial & Mangold, 1995, p.154).

The consumer behavior field has investigated these three dimensions of prior knowledge (objective, subjective and usage experience) in terms of their impact on attribute importance (Park and Lessig 1981; Rao and Monroe 1988; Raju, Lonial, and Mangold 1995), quality and content of product information (Alba 1983), information search (Brucks 1985; Moore and Lehman 1980; Johnson and Russo 1984; Rudell, 1979), and information processing and decision-making (Alba 1983; Brucks 1985; Alba and Hutchinson 1987; Johnson and Russo 1984; Srull, 1983; Bettman and Park 1980; Raju, Lonial, and Mangold 1995).

Even though consumer behavior research in this area is vast, and most recent studies have been consistent in identifying three dimensions of prior knowledge, studies have lacked consistency in how they conceptualize and operationalize these prior knowledge dimensions. Examples of these inconsistencies can be seen in Table 1. In

Article	Knowledge Definitions and Operationalizations
Rudell (1979)	Objective and Subjective Knowledge only defined operationally. Operationally: Measured objective "nutrition knowledge" based on the number of correct answers on nutrition test. Subjective knowledge was self-report; "To what extent do you feel the need for more nutritional information between these brands?" (p. 118).
Bettman and Park (1980)	Objective and Subjective Knowledge only defined operationally. Operationally: Measured objective knowledge based on self-reported search, use or microwave ownership. Subjective knowledge was self-report, based on "familiarity with microwave ovens as a manipulation check" (p. 238).
Moore and Lehman (1980)	Objective and Subjective Knowledge only defined operationally. Operationally: Objective and subjective knowledge were self-report measures based on "experience". Objective knowledge was based on two questions/statements; "Have you bought anything from the bakery in the last month?" and "I do most of the bread shopping for my household". Subjective knowledge was measured by "I know a lot about nutrition", (p. 301).
Russo and Johnson (1980)	Objective Knowledge not explicitly defined. Subjective Knowledge only defined operationally. Operationally: Subjective knowledge was self-report, based on "familiarity" with "different brands and attributes for a number of product classes" (p. 420).
Park and Lessig (1981)	Objective and Subjective Knowledge were defined in terms of "product familiarity". Objective Knowledge was conceptualized as "how much a person knows about the product" and Subjective Knowledge as "how much a person thinks s/he knows about the product" (p. 223). Operationally: Measured objective knowledge based on self-reported search, use or microwave ownership (p. 225). Subjective knowledge was self-report, based on "familiarity" "with microwave oven features", which "would be important in making a choice". "Confidence in the selections made" were also measured after the participants indicated the level of "difficulty with this choice reduction task" (p. 226).
Alba (1983)	Objective Knowledge not explicitly defined. Subjective Knowledge only defined operationally. Operationally: Subjective knowledge was self-assessed, based on "knowledge of stereos" (p. 577).

Table 1: Examples of Knowledge Definitions and Operationalizations in Consumer Behavior

Article	Knowledge Definitions and Operationalizations
Srull (1983)	Objective knowledge not explicitly defined. Subjective Knowledge only defined operationally. Operationally: Subjective knowledge was self-report, based on "familiarity" with "automobiles" (p.573).
Johnson and Russo (1984)	Objective Knowledge not explicitly defined. Subjective Knowledge defined in terms of familiarity. Operationally: Subjective knowledge was self-report, based on "knowledge of automobiles, compared to the rest of the population" (p. 545).
Brucks (1985)	Objective knowledge defined as "what is actually stored in memory." Subjective knowledge defined as "what individuals perceive that they know"…"In summary, there is a conceptual distinction between objective and subjective knowledge. Subjective knowledge can be thought of as including an individual's degree of confidence in his/her knowledge, while objective knowledge refers only to what an individual actually knows" (p. 2). Operationally: Measured objective "sewing machine knowledge" based on a number of "free response questions". Subjective knowledge was self-report; based on two measures "Rate your knowledge of sewing machines, as compared to the average woman" and "Circle one of the numbers below to describe your familiarity with sewing machines" (p.7).
Park, Mothersbaugh, and Feick (1994)	Follows Brucks (1985) definitions and operationalizations of objective knowledge and self-assessed/subjective knowledge.
Raju, Lonial and Mangold (1995)	Follows Brucks (1985) definitions and operationalizations of objective and subjective knowledge.
Moorman, Diehl, Brinberg, and Kidwell (2004)	Follows Brucks (1985) definitions for objective and subjective knowledge. Operationally: Measured Objective knowledge as Brucks (1985). Subjective knowledge was measured via adapted measures of Brucks (1985). More specifically, the measurement of Subjective knowledge, compared to Brucks (1985) operationalization, included the measurement of confidence; "How confident do you feel about your ability to make low-fat choice?" and "How confident do you feel about your ability to use your knowledge of fat in making food choices?" (p.678).
Carlson, Vincent, Hardesty and Bearden (2009)	A meta-analysis study positing the use of Brucks (1985) definitions for objective and subjective knowledge (page 865).

Table 1 (continued):   Examples of Knowledge Definitions and Operationalizations in Consumer Behavior

summary, prior knowledge has been defined as "familiarity" (Bettman & Park, 1980), "expertise" (Moore and Lehman, 1988) and "familiarity and experience" (Alba & Hutchinson, 1987), among other definitions. Recently, researchers in consumer behavior have tried to reduce these conceptual inconsistencies by employing Brucks' (1985) definitions of prior knowledge dimensions (even though Rudell (1979) was the first to distinguish between objective and subjective knowledge).

Prior knowledge has also been operationalized via different measures, such as frequency of purchase (Bettman & Park, 1980; Park & Lessig 1981), objective tests (Rudell, 1979; Brucks, 1985), and self-reported measures (Alba, 1983; Moorman et al, 2004). Different terms for subjective knowledge have been used, such as "self-perceived" (Moorman et al. 2004), "self-reported" (Moore & Lehman, 1988) and "self-assessed" (Alba, 1983) knowledge. These inconsistencies in the operationalization and conceptualization of prior knowledge dimensions within the consumer behavior field is making it difficult for researchers to compare results and contribute to the evolution of the topic, since researchers cannot be sure of what has actually been measured.

2.2. THE ECONOMIC PSYCHOLOGY PERSPECTIVE ON PRIOR KNOWLEDGE

In spite of the large amount of consumer behavior research examining the prior knowledge construct (Table 1), researchers neglect to address to what extent an individual applies in his/her knowledge in decision-making situations (a concept from economic-psychology). According to Wyer (2008), psychologists have long suggested that individuals make decisions based on a subset of their knowledge that they can access (cf., Higgins, 1996; Bargh 1994; 1997; Wyer, 2004). This implies that even though an

individual might know something, he/she will not necessarily act on that knowledge or apply that knowledge to himself/herself. According to economic psychology this dimension of prior knowledge, which refers to what extent an individual applies his/her knowledge in decision-making situations, is missing from the consumer behavior conceptualizations of prior knowledge.

This dimension of prior knowledge is called personal knowledge in economic-psychology, and is defined as "*what a particular individual takes to apply to himself, and which is therefore taken into consideration for his own behavior. Much of what is subjectively known is not accepted for oneself. A would-be criminal may well know subjectively the official conviction rate but he may think that this 'probability of conviction' does not apply to himself*" (Frey and Foppa 1985, 147). Personal knowledge is of great importance in terms of understanding behavior.

In addition to personal knowledge, the economic psychology field also distinguishes between objective and subjective knowledge, even though definitions are very different than in the consumer behavior field. Objective knowledge, according to Frey and Foppa (1985) refers to "*the findings included in (official) statistics. In the area of crime, for instance, it would include the share of punished illegal acts to all illegal acts (disaggregated for the various types of crime)*" (Frey and Foppa, 1985, 147). Subjective knowledge refers "*to what the individuals believe to be objectively true. It can, of course, deviate; an individual may, for instance, have cast delusions about what share of murderers is convicted*" (Frey and Foppa 1985, 147).

2.3. DIFFERENCES IN PRIOR KNOWLEDGE CONCEPTUALIZATIONS

Table 2 summarizes the differences in prior knowledge conceptualizations between the consumer behavior and economic psychology fields. The construct of "objective knowledge" in consumer behavior is the same construct (framed differently) as what Frey and Foppa (1985) term "subjective knowledge". Consumer behavior focuses on memory in subjective knowledge definitions (e.g., Brucks, 1985), while from the perspective of economic psychology Frey and Foppa (1985) frame subjective knowledge in terms of beliefs about objective knowledge. According to Frey and Foppa (1985), subjective knowledge can be seen as the number of correct answers out of a test score, which represent the "truth". In the consumer behavior field, subjective knowledge is a self-perception of the perceived amount of knowledge (which does not exist in economic psychology's conceptualizations of prior knowledge).

Brucks' (1985) conceptualization of "subjective knowledge" includes "knowledge confidence", but Brucks did not measure confidence. On the contrary, recent studies within consumer behavior, such as Moorman et al. (2004), explicitly measure knowledge confidence as part of what consumer behavior calls subjective knowledge. Personal knowledge is a unique form of knowledge, identified by Frey and Foppa (1985), which is absent from the consumer behavior literature. Personal knowledge is important for understanding behavior, which is why it should be taken into account as part of an individual's prior knowledge set. Along the same lines, usage experience is another form of knowledge, identified in the consumer behavior field, which is absent from the economic psychology field.

	Consumer Behavior	**Economic Psychology**
Objective Knowledge	"What is actually stored in memory" (Brucks, 1985, p.2).	"The findings included in (official) statistics" (Frey and Foppa, 1985, p.147).
Subjective Knowledge	"What individuals perceive that they know" (Brucks, 1985, p.2).	"What an individuals believes to be objectively true" (Frey and Foppa, 1985, p.147).
Knowledge Confidence	"An individual's degree of confidence in his/her knowledge", which is considered an element of Subjective Knowledge (Brucks, 1985, p.2).	n.a.
Personal Knowledge	n.a.	"What a particular individual takes to apply to himself, and which is therefore taken into consideration for his own behavior" (Frey and Foppa, 1985, p.147).
Usage Experience	"Whether an individual has "used, owned or searched for information about" a product (Raju, Lonial and Mangold, 1995, p.154).	n.a.

Table 2: Differences in Prior Knowledge Conceptualizations between Consumer Behavior and Economic Psychology

2.4. PROPOSED DIMENSIONS OF PRIOR KNOWLEDGE

To reduce these inconsistencies and to extend the prior knowledge literature, the present study proposes six dimensions of prior knowledge based on both consumer behavior and economic psychology fields. The suggested dimensions of prior knowledge can be seen in Figure 1 and their conceptualizations in Table 3.
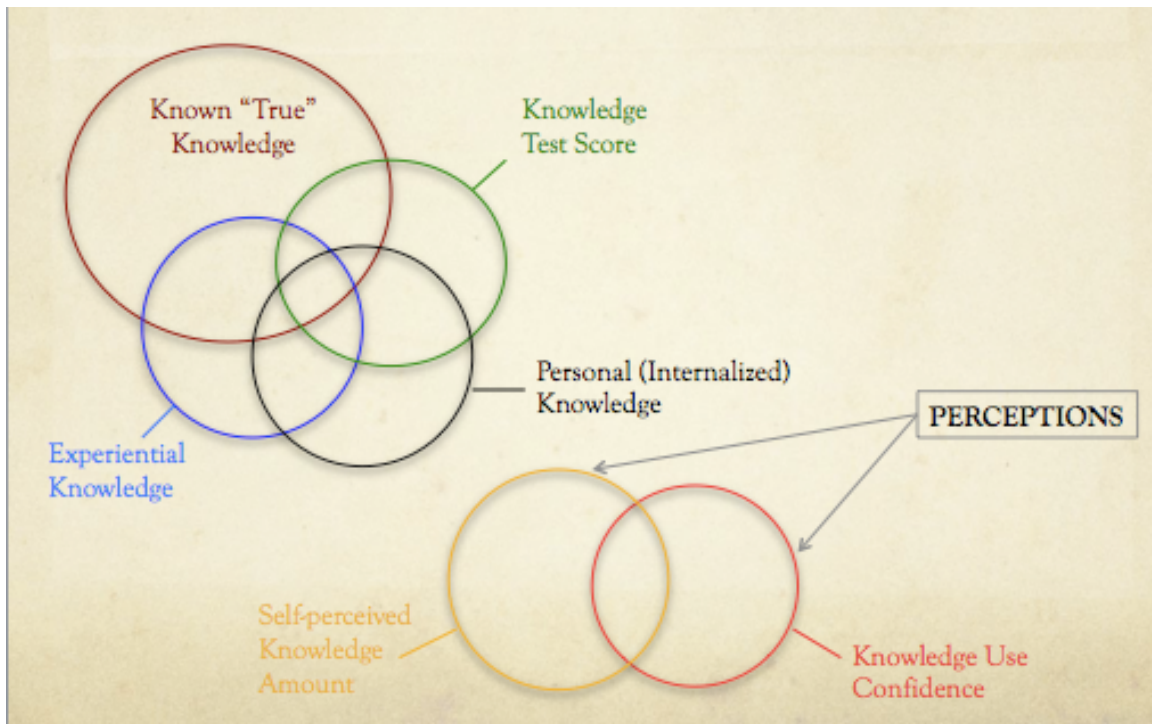
Figure 1:   Suggested Dimensions of Prior Knowledge

Known "true" knowledge is external to the individual, as opposed to the other identified knowledge dimensions seen in Figure 1, which are specific to the individual. It represents what is officially known to be true (e.g., facts, statistics, etc.). Known "true" knowledge is a construct that cannot be measured – it's an abstract concept. In the consumer behavior field, this concept is not explicitly defined but is used as a point for comparison when measuring knowledge test score. The present study explicitly identifies known "true" knowledge as a separate dimension of prior knowledge.

Knowledge test score is the correct number of answers out of the known "true" knowledge. It refers to the extent to which an individual's knowledge is consistent with what is officially known to be true. Individuals often have misconceptions about what is true, which impacts their behavior (Alba & Hatchinson, 2000). The conceptualization of knowledge test score appears in both the consumer behavior and the economic

Suggested Knowledge Types	Definitions
Known "True" Knowledge	What is officially known to be true (Frey and Foppa's 1985 definition of "objective knowledge").
Knowledge Test Score	Accuracy of an individual's knowledge stored in memory, measured as the amount of correct answers out of the 100% possible known "true" knowledge. (Consumer behavior's "objective knowledge" and economic psychology's "subjective knowledge").
Self-perceived Knowledge Amount	How much an individual thinks he/she knows (Brucks, 1985 definition of "subjective knowledge").
Knowledge Use Confidence	An individual's degree of confidence in using his/her knowledge. (An element of "subjective knowledge" from the consumer behavior literature, operationalized as the confidence in using knowledge).
Personal (Internalized) Knowledge	To what extent an individual applies his/her knowledge in decision-making situations. (Concept adapted from economic psychology, not in consumer behavior literature).
Experiential Knowledge	Whether an individual has used, owned or searched for information about a product or a topic. (Concept from consumer behavior, but not in the economic psychology prior knowledge literature specifically).

Table 3:   Proposed Dimensions of Prior Knowledge and Definitions

psychology literatures. However, the present study gives this conceptualization a label that is more representative of what it actually measures. Consumer behavior calls this dimension of prior knowledge *objective* however, there is nothing objective about what an individual believes it's true.

Knowledge test score and known "true" knowledge may overlap depending on whether or not an individual's knowledge is consistent with the known "true" knowledge. The more accurate an individual's knowledge is with the known "true" knowledge, the greater the overlap between the circles representing known "true" knowledge and knowledge test score (Figure 1).

Experience has a significant impact on behavior (Raju, Lonial, & Mangold, 1995). It has long been suggested that decisions based on experience are more resistant to change, according to the Elaboration Likelihood Model (ELM). Therefore, based on an individual's experience (with a product or issue), his/her behavior can be predicted. Experiential knowledge may overlap with other prior knowledge dimensions. Depending on the accuracy of an individual's knowledge based on his/her experiences, experiential knowledge may overlap with known "true" knowledge. Moreover, depending on how much knowledge an individual gains from experience, experiential knowledge may overlap with knowledge test score, as depicted in Figure 1.

Personal (internalized) knowledge has been suggested to have a direct impact on consumer's actions (Frey & Foppa, 1985), because even though an individual might be knowledgeable (about an issue or a product), he/she might not use that knowledge when making decisions. Personal (internalized) knowledge is a small subset of an individual's knowledge test score and/or experiential knowledge. The larger the subset of his/her knowledge an individual uses, the greater the overlap with knowledge test score and/or experiential knowledge. Based on whether or not this knowledge is accurate personal knowledge may also overlap with known "true" knowledge.

Moreover, the last two dimensions of prior knowledge suggested here are based on an individual's self-perceptions. Self-perceived knowledge amount and knowledge use confidence are subjective perceptions of how much an individual knows and his/her confidence in using his/her knowledge. Both of these conceptualizations of prior knowledge are based on the consumer behavior literature.

Brucks (1985) conceptualized self-perceived knowledge amount (called subjective knowledge in consumer behavior), as the individual's self-perceived level of knowledge (how much an individual thinks he/she knows). Brucks' (1985) conceptualization of self-perceived knowledge amount included the individual's confidence in using his/her knowledge (knowledge use confidence). However, it was not until Moorman et al. (2004) that confidence was measured as part of the self-perceived knowledge amount.

The present study suggests that knowledge use confidence should be a separate construct, and not part of the self-perceived knowledge amount conceptualization (Manika & Golden, 2010). Even if an individual thinks he/she knows a lot about a topic or product (high self-perceived knowledge amount), he/she will behave differently based on how much confidence he/she has in using his/her knowledge. Therefore, it is suggested that an individual's behaviors are affected by both his/her self-perceived knowledge amount and his/her knowledge use confidence amount, separately.

In conclusion, knowledge is part of our human capital. *"What we know shapes our lives and what we do not know makes us incapable of making a decision"* (Keely, 2007). It is important to examine each of the suggested six dimensions of prior knowledge, shown in Figure 1, in order to understand consumer behavior. The present study investigates the impact of the six dimensions of prior knowledge on health-related behaviors, and more specifically on two dependent variables: health information-seeking and prevention behaviors.

According to Carlson et al. (2009), only a limited number of consumer behavior studies have examined prior knowledge within a health context. Most of these studies

have focused on nutritional information and the impact of prior knowledge on information search (e.g., Rudell, 1979; Moorman et al., 2004). The relationship between prior knowledge and information seeking has also been investigated in the information-seeking literature. However, most information-seeking studies have focused on the effect of one prior knowledge dimension (at a time). The present study seeks to investigate all the proposed dimensions of prior knowledge on information seeking, thus, advancing both consumer behavior and information-seeking literatures.

Further, the present study is the first one to look at prior knowledge effects on disease prevention behaviors, within the consumer behavior literature. The following chapter (Chapter Three) focuses on prior consumer behavior and information-seeking research findings regarding the relationship between prior knowledge and health information-seeking. A discussion of the importance of prior knowledge for disease prevention behaviors and DTC advertising is also presented in Chapter Three.

Chapter Three: Health Information-seeking and Prevention Behaviors

One of the present study's aims is to examine the impact of the proposed dimensions of prior knowledge on health information-seeking and prevention behaviors (the two dependent variables of the present study), in an effort to create effective DTC advertising messages (as discussed in Chapter One of this dissertation). The relationship between prior knowledge and health information-seeking has been empirically examined in both the consumer behavior and the information-seeking fields. However, there is a lack of relevant literature regarding the relationship between prior knowledge and prevention behavior, since the present study is the first one to look at this relationship.

Therefore, Chapter Three provides a summary of prior findings on the relationship between prior knowledge and health information-seeking, based both consumer behavior and information-seeking literatures. Since information-seeking is considered to be a type of prevention behavior, which is why DTC advertising messages both try to motivate consumers to take recommended prevention measures and include additional sources consumers can go to for information, a review of the direct-to-consumer literature related to prior knowledge also follows.

Today individuals are responsible for their own health (Meische, 1991), as opposed to in the past when consumers only relied on their doctor to make health-related decisions for them and provide health-related information. Because health responsibility today, lies with the individual, understanding how an individual's prior knowledge set affects his/her health-related behavior, is an important step in the health communication

process, and vital for the successful implementation of a DTC or public health promotion campaign.

3.1. THE RELATIONSHIP BETWEEN PRIOR KNOWLEDGE AND HEALTH INFORMATION-SEEKING

According to Ratchford (2008), an individual's information-seeking (search) activities depend on his/her prior knowledge set (any type of information that the individual already has). In short, this implies that the way in which information is presented has an impact on whether or not it will yield search (Ratchford, 2008). This is of importance to health communicators and public policy makers, who often tend to refer consumers to additional sources of information, other than the message itself, in an effort to persuade them to take the appropriate disease prevention measure.

Recent research highlights that people with acute and chronic illnesses often engage in information-seeking activities towards improving their health (Freimuth, Stein, and Kean, 1989; Brashers, Goldsmith, & Hsieh, 2002). Consumers' goals for these information-seeking activities may range from understanding their diagnosis to even considering treatments they want to discuss with their doctor (Freimuth, Stein, and Kean, 1989; Brashers, Goldsmith, & Hsieh, 2002). According to Palsdottir (2010), consumers' health information-seeking activities can also be interpreted as, consumers having control over their health, and/or lives. Both the information-seeking and consumer behavior literatures have examined this relationship between knowledge and information-seeking.

3.1.1. Information-seeking Literature

Attempts to understand when and how people seek information have been considerably diverse within the information-seeking literature (Freimuth, Stein and Kean,

1989; Johnson and Meischke, 1993; Brashers, Goldsmith and Hsieh, 2002; Afifi and Weiner, 2004; Lambert & Loiselle, 2007; Kahlor, 2010). However, this research is not without limitations. Prior research has examined information-seeking within the contexts of specific health conditions (Kahlor, 2010). This is why health information-seeking as a concept remains only "partially developed" (Lambert & Loiselle, 2007, p. 1007), as it lacks "distinct characteristics, delineated boundaries, and well-described preconditions and outcomes" (Lambert & Loiselle, 2007, p. 1007).

According to the information-seeking literature, prior knowledge has a direct impact on how consumers seek, encounter, and avoid information (Toms, 2000; Wilson, 2000). Prior knowledge is considered one of those robust variables that have a significant impact on information-seeking (Kahlor, 2010). Many information-seeking models have identified prior knowledge as an important construct in the information acquisition process (e.g., the Health Information Acquisition Model (HIAM) by Freimuth, Stein and Kean, 1989; the Comprehensive Model of Information-seeking (CMIS) by Johnson and Meischke, 1993; the Theory of Motivated Information Management (TMIM) by Afifi and Weiner, 2004; the Planned Risk Information-seeking Model (PRISM) by Kahlor, 2010).

However, the conceptualization and operationalization of the "prior knowledge" construct within these information-seeking models has not been consistent or complete (including all proposed dimensions of prior knowledge proposed in the present study). A short review of the information seeking models that identify prior knowledge (implicitly or explicitly) as a construct that impacts information-seeking activities follows (in historical order). These information-seeking models presented here are the only information-seeking models that explicitly identify prior knowledge to be a significant

predictor of information-seeking activities. A summary of their commonalities and differences in terms of how they operationalize prior knowledge signifies how the information-seeking literature treats the prior knowledge construct and its relationship with information-seeking.

3.1.1.1. Information Acquisition Model (HIAM) by Freimuth, Stein and Kean (1989)

The first information-seeking model to identify prior knowledge, as a predictor of health-related information seeking activities, is the Health Information Acquisition Model (HIAM) by Freimuth, Stein and Kean (1989). The HIAM identifies the decision-making process an individual goes through when deciding whether or not to seek additional health-related information about a health-related issue. According to this model, the first step of the HIAM entails an assessment of one's "current information" (prior knowledge) and whether or not additional information is needed after the consumer is exposed to a stimulus (see Figure 2).

A consumer will engage in active information-seeking, if he/she searches his/her memory for information on a particular topic and experiences uncertainty regarding that particular topic (e.g., treatment options, prognosis, etc.), according to the HIAM. Uncertainty refers to the difference between what a consumer thinks he/she knows and what a consumer would like to know (Kahlor, 2010). If a consumer would like to know everything that there is to know about a health-related topic (which would resemble the known "true" knowledge dimension of prior knowledge), uncertainty is the difference between an individual's knowledge test score and known "true" knowledge.
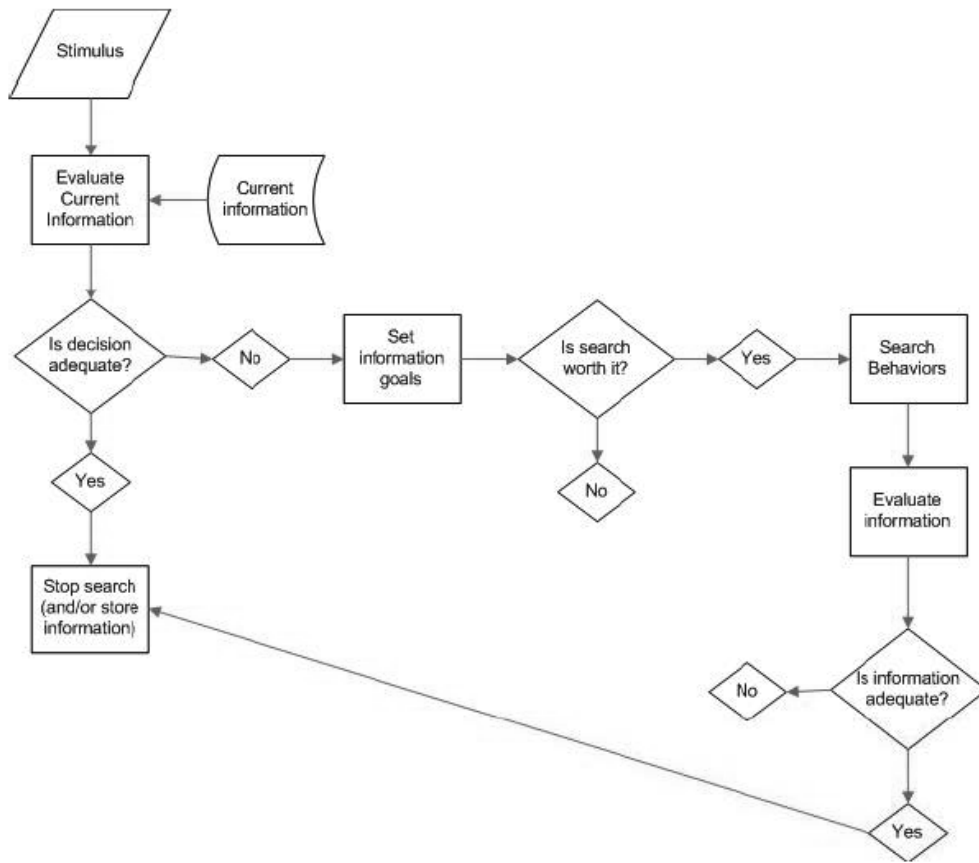
Figure 2:   Health Information Acquisition Model (HIAM)
Source: Freimuth, Stein and Kean (1989)

3.1.1.2. The Comprehensive Model of Information-seeking (CMIS) by Johnson and Meischke (1993)

Another information-seeking model that specifically identifies prior knowledge as a predictor of information-seeking behavior is the Comprehensive Model of Information-seeking (CMIS) by Johnson and Meischke (1993). More specifically, the CMIS conceptualizes prior knowledge as an antecedent factor (part of the *background factors*) of information-seeking. The CMIS prior knowledge conceptualization resembles what the

present study calls experiential knowledge (labeled "Direct Experience" as shown in Figure 3). Experiential knowledge, according to CMIS, can be used as an audience segmentation tool (Case, 2002).
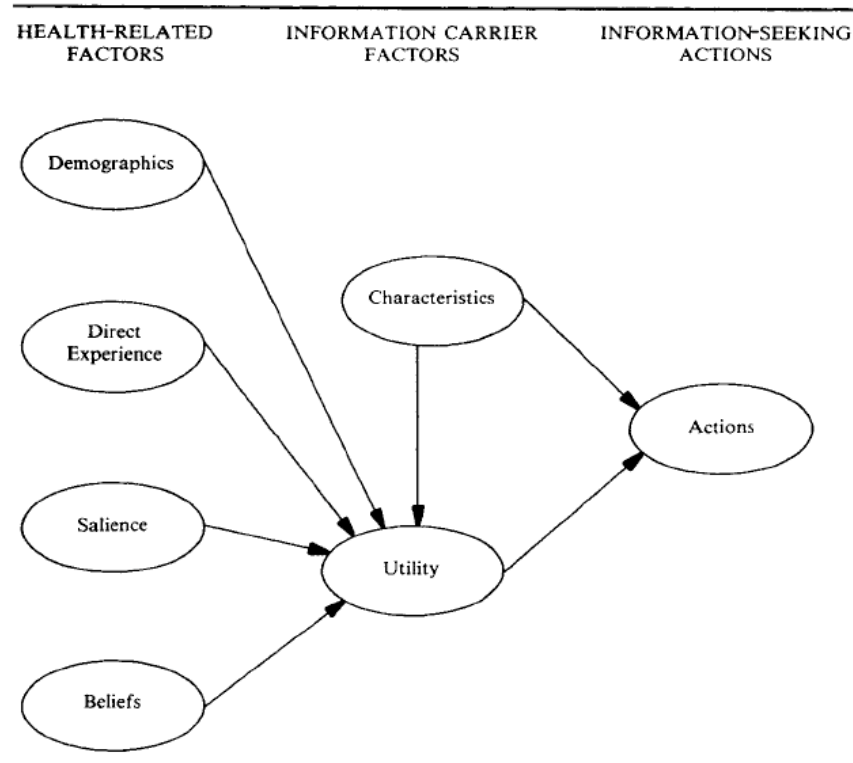
Figure 3:   Comprehensive Model of Information-seeking (CMIS)
                Source: Johnson and Meischke, (1993)

3.1.1.3. The Theory of Motivated Information Management (TMIM) by Afifi and Weiner (2004)

Following the notion of uncertainty in the HIAM, The Theory of Motivated Information Management (TMIM) by Afifi and Weiner (2004) also identifies the difference between an individual's self-perceived knowledge amount and what an individual would like to know (representing known "true" knowledge is the individual would like to know everything about the health-related issue/topic), as an important

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determinant of behavior (more specifically it indirectly affects information-seeking as shown in Figure 4). This difference is labeled "uncertainty discrepancy" in the TMIM.
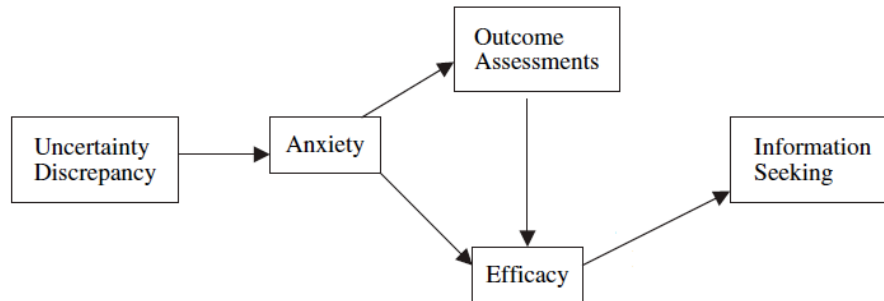
Figure 4:   Theory of Motivated Information Management (TMIM)

Source: Afifi and Weiner (2004)

3.1.1.4. *The Planned Risk Information-seeking Model (PRISM) by Kahlor (2010)*

Lastly, the more recent health-related information-seeking model that identifies prior knowledge as an important predictor of information-seeking is the Planned Risk Information-seeking Model (PRISM) by Kahlor (2010). PRISM is an integrated model of health risk information-seeking, based on many prior information-seeking models and identifies two dimensions of prior knowledge: "perceived current knowledge" and "perceived knowledge insufficiency" (see Figure 5). "Perceived current knowledge" is similar to what the present study labels self-perceived knowledge amount. "Perceived knowledge insufficiency" is similar to the difference between self-perceived knowledge amount and what a consumer would like to know (representing known "true" knowledge is the individual would like to know everything about the health-related issue/topic). This is the only information-seeking model that explicitly portrays the self-perceived

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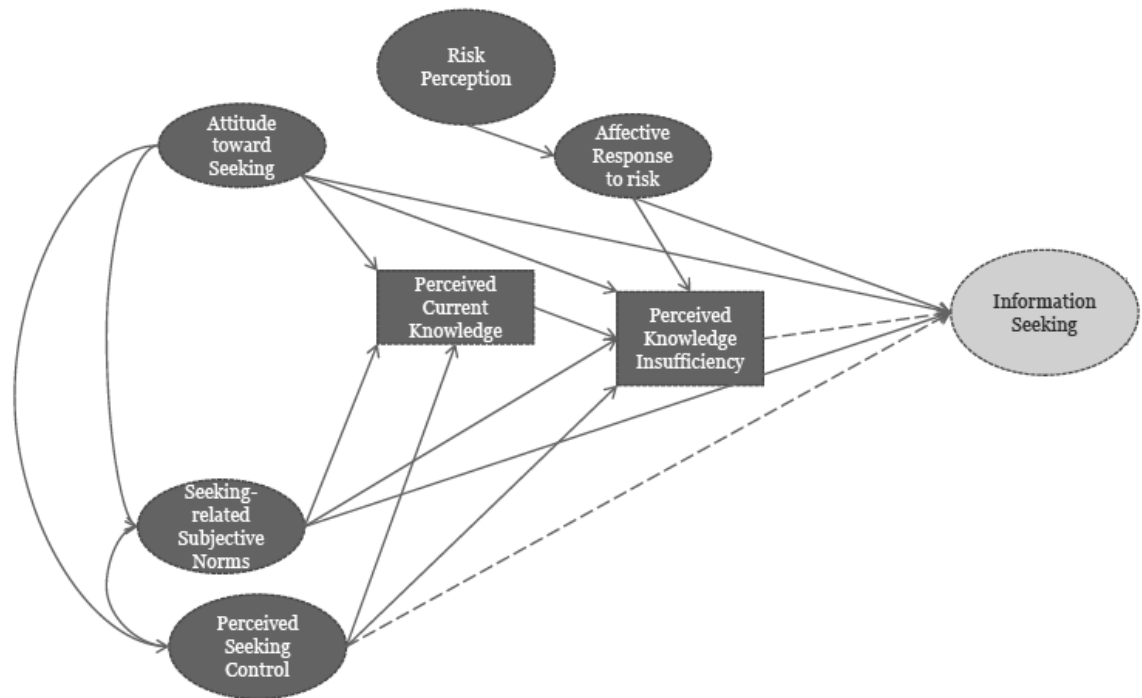
Figure 5:   Planned Risk Information-seeking Model (PRISM)
                Source: Kahlor (2010)

knowledge amount dimension of prior knowledge, as having an impact on information-seeking intentions.

In summary, the health information-seeking models, discussed here that identify prior knowledge as an important construct in understanding information-seeking behaviors, only refer to a maximum of two prior knowledge dimensions per model. The dimensions identified by these models are known "true" knowledge, knowledge test score, self-perceived knowledge amount, and experiential knowledge. In addition, knowledge use confidence, and personal knowledge are absent from the information-seeking literature. Thus, investigating the impact of all the prior knowledge dimensions proposed in the present study and their impact on information-seeking can also be seen as a further development of the information-seeking literature (in addition to the evolution

of the consumer behavior field regarding the relationship between prior knowledge and information-seeking).

3.1.1.5. Additional Considerations based on the Information-seeking Literature

The information-seeking literature also makes some additional contributions to the consumer behavior field in terms of the information-seeking construct, which are taken into account by the present study. It should first be noted here that these information-seeking models discussed in the previous sub-section of this dissertation, tend to measure information-seeking via measures of information-seeking intent or past information-seeking behaviors. On the contrary, consumer behavior usually measures past information-seeking. The present study advances the consumer behavior literature by examining the relationship between prior knowledge and information-seeking, via a measure of information-seeking intentions.

Further, the information-seeking literature distinguishes between active and passive information-seeking behaviors, which contributes to the operationalization of the information-seeking intentions construct in prior information-seeking literature. Information-seeking literature also distinguishes among interpersonal, intrapersonal and mass-mediated sources of information-seeking, which are also taken into account by the present study. A summary of these considerations, based on the information-seeking literature, are discussed below:

- *Active and Passive Health Information-seeking*

Based on the information-seeking literature, information-seeking activities can be active or passive (information-seeking/encountering) (Aaker et al., 1992; Wilson, 2000; Dutte-Bergman, 2004; Palsdottir 2010). According to Aaker, et al. (1992), active

information-seeking takes place when an individual experiences high levels of risk and uncertainty associated with a decision, which motivates the individual to seek more information in order to reduce the risk and uncertainty associated with the decision. Wilson (2000) further suggests that active information-seeking is the result of an individual's lack of knowledge regarding a topic. Therefore, an individual with a considerable amount of prior knowledge regarding a particular topic would likely be less motivated to seek additional information than someone with limited prior knowledge.

Active information-seeking is also associated with "*a need to satisfy some goal*" (Wilson, 2000), as opposed to passive information-seeking/encountering, which takes place when an individual finds information, he/she did not purposively try to find (Wilson, 2000). Passive information encountering/seeking as non-goal driven (McKenzie, 2003). Erdelez (1997) first introduced the term "information encountering" to refer to this unexpected discovery of information and distinguish it for information-seeking. In contrast to information encountering, information-seeking tends to be considered an active, goal-driven behavior.

Recent information-seeking studies have also distinguished between different effort levels of information-seeking, evident by their operationalization of the information-seeking construct. Palsdottir (2010) identifies four levels of information-seeking and encountering (passive, moderately passive, moderately active, active), while Kahlor (2010) views information-seeking as information-seeking intent, measured on a 5-point scale. Other studies also identify "information avoidance" (when an individual makes an effort to avoid information even when received passively), as an additional

level of information-seeking (Brashers, Goldsmith, & Hsieh, 2002; Affifi and Weiner, 2004).

An additional aspect of active information-seeking is whether or not the individual will continue to search for information or not (Freimuth, Stein and Kean, 1989). If the individual is actively seeking for information, then he/she will not stop to seek that information until he/she finds it, seeking information becomes hard, the individual runs out of time, or until the information becomes difficult to process (Freimuth, Stein and Kean, 1989; Betteman, 1979). Therefore, information-seeking activities can be distinguished in terms of whether they are active or passive and how much effort is placed by the individual on the information-seeking activity, as well as in terms of whether these information-seeking activities are continuous or a one-time behavior.

- *Sources of Health Information-seeking*

Moreover, when looking at health information-seeking, it is also important to distinguish between internal and external sources of information-seeking. According to Freimuth, Stein and Kean (1989), there are three types of information sources where people can look for information: intrapersonal, interpersonal, and mass-mediated sources. Intrapersonal sources, which are internal and tend to be unique to the individual, "*consist of all previous knowledge, beliefs, and attitudes about health which might have been developed from earlier communication experiences*" (Freimuth, Stein and Kean, 1989, p.12). Individuals who use intrapersonal sources of information tend to rely only on their memory (knowledge test score).

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Interpersonal sources include individuals, such as health professionals, doctors, fellow patients, family, and friends. Even though doctors and health professionals might be the most trusted sources, they also tend to be the least accessible. This lack of accessibility to health professionals explains why family and friends are the most commonly used health information sources, due to their ease of accessibility (Freimuth, Stein and Kean, 1989).

Lastly, encountering health information through mass media is common in today's world (Kahlor, 2010; Palsdottir, 2010). Mass media tend to disseminate information (Freimuth, Stein and Kean, 1989), which is why they tend to be perceived as untrustworthy. Nonetheless, mass media has an impact on what we know, what we think we know, the level of confidence we have in that knowledge, what we take to apply to ourselves, our perceived level of experience with a product, health risk, etc.

The use of the Internet for health information-seeking is a common practice, according to recent surveys by the Pew Internet & American Life Project. These surveys suggest that although consumers are aware of misinformation online, these concerns are allayed by the perceived positive impact this information has had on health decision-making and behaviors (Fox 2008, 2006; Madden and Fox 2006; Ball, Stout & Manika, 2009). It is important to note that eight in ten Internet users go online for health information (Fox, 2006). Consumers often use strategies such as consulting multiple websites and checking with health professionals online as a way to improve their health without having to physically go to the doctor's office (Fox 2008, 2006; Madden and Fox 2006; Ball, Stout & Manika, 2009).

Mass-mediated exposure to health information does not always have to be an active, goal-oriented information-seeking behavior. Prior research tends to distinguish between active mass-mediated sources of information, such as print readership and Internet communication, and passive mass-mediated sources of information, such as television and radio (Dutta-Bergman, 2004). Active mass-mediated information encountering requires more effort than passive, therefore, individuals who expose themselves to active mass-mediated sources of information are more interested/motivated to seek additional information about a health-related topic, than the ones who use passive mass-mediated sources.

Prior research has also investigated consumers' preferences of health information-seeking activities. Media is the most common source of health information, followed by doctors, family and friends, and, lastly, organizations (Johnson & Meischke, 1991a). These information-seeking preferences also vary with the age of the information seeker (Ball, Manika & Stout, 2010). For example, older adults are substantially less likely to consult friends and relatives, than younger adults, even though both groups rated this information source lowest behind both healthcare professionals and the media (Ball, Manika & Stout, 2010). In contrast, friends and family served as the primary source of prescription medicine information for college students, above health professionals and the media (Ball, Manika & Stout, 2010).

Identifying the preferred information sources and channels has been an important component of prior health information-seeking research (Johnson & Meischke, 1991b; Marcus & Tuchfield, 1993), as it can guide development of effective health promotions and campaigns (Rutten et al., 2009). Understanding the information-seeking source

preferences of target audiences is an important step in the health communication process (Rutten et al., 2009).

Therefore, the present study will employ a measure of information-seeking intent that takes into account both active/passive information-seeking activities, as well as gauges consumers' information-seeking source preferences (by distinguishing among intrapersonal, interpersonal, and mass-mediated sources of information). In conclusion, this section reviewed the relevant information-seeking literature, from which it can be concluded that prior knowledge is an important construct for understanding information-seeking behaviors, and that the present investigation will advance both consumer behavior and information-seeking literatures (in terms of the relationship between prior knowledge and information-seeking). The following section discusses the relationship between prior knowledge and information-seeking, based on prior consumer behavior research findings.

3.1.2. Consumer Behavior Literature on Information-seeking

Prior research within the consumer behavior field has also examined the impact of prior knowledge on information-seeking (measured as past information search). Specifically, the consumer behavior field focused on the differences between knowledge test score and self-perceived knowledge amount, in terms of their impact on external and internal information-seeking.

Knowledge test score has been found to facilitate the deliberation and use of information stored in memory (internal) (Rudell, 1979; Brucks, 1985; Moore and Lehmann, 1980), while self-perceived knowledge amount has been found to facilitate the acquisition of new information (Rudell, 1989), meaning consumers with a higher self-

perceived knowledge amount would seek new information, more than someone with high knowledge test score. The relationship between prior knowledge and external information search, however, has not been clear, as prior empirical studies provide varying results (Ratchford, 2008).

Some early studies found a negative relationship between prior knowledge and external information search (Moore & Lehman, 1980). Consumers with greater knowledge, engaged in a low amount of information search, as opposed to consumers with a relatively lower knowledge, who in turn engaged in a higher amount of information search (Moore & Lehman, 1980). It has been suggested that the reason behind this result is that highly knowledgeable consumers are aware of more product attributes and alternatives than relatively low knowledgeable consumers. Therefore, highly knowledgeable consumers would be less likely to feel the need to search for information than the low knowledgeable ones (Raju, Lonial & Mangold, 1995). Another explanation would be that these highly knowledgeable consumers can search for information much quicker as they would have that knowledge. Thus there is no need to search for long periods of time, unlike the low knowledgeable consumers who would require a longer search period (Raju, Lonial & Mangold, 1995).

Other studies have found a positive relationship between information search and knowledge (Johnson & Russo, 1984), suggesting that high knowledge consumers would more likely engage in a higher amount of information search than low knowledge consumers. According to Johnson & Russo (1984), consumers with high knowledge are able to process more information than low knowledge consumers. High knowledge

consumers are inclined to search for more information, as opposed to the low knowledge consumers, who are less inclined to search for more information.

Brucks's (1985) study which was a seminal work in the prior knowledge arena, found an inverted U-relationship, where consumers with low to moderate levels of knowledge had a positive relationship with information search, while consumers with moderate to high levels of knowledge had a negative relationship with information search. This inverted U-relationship existed due to the fact that only moderately knowledgeable consumers would have both the ability and motivation to search for information (Brucks, 1985).

Recently, it was suggested that the type of the relationship between knowledge and information search depends on the knowledge dimension (Raju, Lonial & Mangold, 1995). Results suggested that knowledge test score has a positive relationship with information search (Raju, Lonial & Mangold, 1995), meaning that knowledge begets knowledge (Golden & Stanaland, 2000). Self-perceived knowledge amount has an inverted U-relationship with information search, consistent with Brucks' (1985) study. Therefore, based on Raju, Lonial & Mangold (1995), the relationship between prior knowledge and information-seeking varies by prior knowledge dimension.

Prior research has also investigated the effect of different knowledge dimensions on the quality of information search (Brucks, 1985; Moorman et al, 2004). Knowledge test score was associated with more efficient searches (Brucks, 1985). Self-perceived knowledge amount also increased the likelihood that an individual would locate himself/herself approximate to the stimuli consistent with his/her self-perceived knowledge amount (Moorman et al., 2004). According to Moorman et al. (2004) this

implies that if someone perceives that he/she knows a lot about a particular topic (e.g. health) then it is likely that he/she would locate himself proximate to the stimuli related to his/her self-perceived knowledge amount (e.g. health places in the store).

Lastly, an individual who has a considerable amount of prior knowledge would be more likely to seek information through intrapersonal (internal) sources, than interpersonal or mass-mediated sources (Moore and Lehmann, 1980). On the contrary, an individual who has a limited amount of prior knowledge would be more likely to seek information through interpersonal or mass-mediated sources than through intrapersonal (internal) sources (Moore and Lehmann, 1980).

In short, consumer behavior found that prior knowledge dimensions significantly impact information-seeking behaviors (including the quality of information search, and source preferences), even though results tend to vary. This section (3.1.2.) concludes the consumer behavior literature on the relationship between prior knowledge and information-seeking.

So far, Chapter Three summarized prior research findings, from both the consumer behavior and information-seeking literatures, in terms of the relationship between prior knowledge and information-seeking. As discussed earlier in the introduction of this chapter (Chapter Three), information-seeking intentions is one of the dependent variables investigated in the present study. The second dependent variable being investigated is prevention behaviors. However, this is the first study to look at the relationship between prior knowledge and prevention behaviors. Therefore, there is no relevant literature to cover in terms of the relationship between prior knowledge and prevention behaviors. However, since a goal of this study is to investigate prior

knowledge and its impact on health information-seeking and prevention behaviors, in an effort to create effective DTC advertising messages, a review of the relevant DTC literature follows.

3.2. DIRECT-TO-CONSUMER ADVERTISING

Advertising in general plays "a variety of roles as an information source" (Rathcford, 2008, p.50). It can be seen as of great value to consumers as it minimizes the search effort needed to acquire the information given to consumers through the advertising message. In the same way Direct-to-Consumer (DTC) pharmaceutical advertising provides health-related information to consumers, since "*consumers are demanding to be involved in decisions affecting their health and quality of life*" (Gareau, 2000, p.2).

According to Bradley & Zito (1997), Direct-to-Consumer (DTC) pharmaceutical advertising has been defined as "*any promotional effort by a pharmaceutical company to present prescription drug information to the general public through the lay media*" (p. 86). Spending on DTC pharmaceutical advertising has risen dramatically (eMarketer, 2009), and 91% of American adults report having seen or heard advertisements for prescription medications (USA Today/Kaiser Family Foundation/ Harvard, 2008).

Many believe that DTC advertising can enable consumers to take a more active role in their health care (Cline and Young 2004), make more informed choices (Main, Argo, and Huhmann 2004), and build bridges among patients and physicians, as it raises awareness about health-related issues. Even though DTC advertising has its proponents, there are also those who believe that such advertising undermines the doctor-patient

relationship (Spake and Joseph, 2007) because DTC can influence patients to request drugs that they do not need.

Although the debate among interested researchers and policymakers continues, it is important to create DTC advertising messages that are not only effective in raising awareness, but also effective in persuading individuals to comply with the health-related action featured in the advertising message (e.g., seeking additional information about a health issue or prescription drug via the suggested source) – in effect creating a win-win scenario of improved patient health and increased sales for pharmaceutical companies.

According to prior findings, 92% of adults say they have searched for information on health for themselves or others in the past six months (Ball, Stout & Manika, 2009). On average respondents also search for health information on a monthly basis (Ball, Stout & Manika, 2009), suggesting that health information-seeking is a common activity among consumers. According to Ball, Manika & Stout (2010), information-seeking activities are not limited to a specific age group, as 93% of college students and young adults, and 89% of older adults, had searched for information on health for themselves or others in the past six months. Even though, health-information seeking is a popular activity, researchers have been unable to explain why the recommended health-related sources, within the DTC advertising messages, should be useful to consumers (Ratchford, 2008).

In order to ensure that these additional sources offered within the DTC advertising messages are of value to consumers, marketers should consider the target audience's prior knowledge set. According to Hong and Sternthal (2010), the presentation of the information (about an issue or product) needs to correspond and be associated with a

consumer's prior knowledge in order to increase the fluency and ease of evaluations (e.g. health-related evaluations). Such correspondence could also result in positive decision-making towards behaviors (e.g., prevention behaviors). Such messages (considering an individual's prior knowledge set) could effectively persuade consumers to take the recommended health-related action featured in the DTC advertising message (e.g., visiting a suggested website for additional information, a common element of current DTC advertising).

The importance of prior knowledge for creating effective DTC advertising messages has also been discussed previously in the DTC advertising literature. More specifically, Huh and Langteau (2010) distinguishes between experts and novices, and investigates their differences in terms of their knowledge test score, as well as the perceived DTC advertising influence on others. Physicians' (tend to be experts) knowledge test scores tend to differ form consumers' (tend to be novices) knowledge test scores, as experts tend to know a lot more about health-related topics than novices (the average consumer). However, consumers can be experts and novices for particular health topics, based on their level of familiarity with DTC advertising. "*Results show that consumer experts clearly exhibit greater perceived DTC advertising influence on others than do novices, and the differences between experts and novices vary by presumed DTC advertising influence dimensions*" (Huh and Langteau, 2010, p.25).

Kim and Park (2010) have also suggested that research on "*how exposure to information about health issues influences consumer health behavior*" (p.166) can provide insights on how DTC advertising messages should be framed. Consistent with Hong & Sternthal's study (2010), Kim and Park (2010) suggest that the way information

is presented affects how the message is perceived and how decisions are made. Based on this notion, Kim and Park (2010), explored the impact of a consumer's self-perceived knowledge amount DTC message framing.

Findings suggest that a loss frame message, focusing on the costs of not following the recommended health-related action of the DTC message, is more effective for a product category for which consumers have limited self-perceived knowledge amount (e.g., a new product category unknown to consumers or the introduction of a product category to a new target segment) (Kim and Park, 2010). As consumers become more familiar with a product category the effect of loss-framed messages loose their appeal (Kim and Park, 2010).

The authors conclude that health practitioners should assess the levels of consumers' self-perceived knowledge amount before designing a health communication campaign (Kim and Park, 2010). In conclusion, Kim and Park (2010) urge future researchers to investigate "*this research initiative on a wider range or diseases, consumer segments and media contexts*" (Kim and Park, 2010, p.174), to contribute to the evolution of the DTC literature. Although the present study does not focus on message framing, it does extend the literature on DTC advertising by looking at the effects of different dimensions of prior knowledge on health information-seeking and prevention behaviors.

In summary, based on the consumer behavior, information-seeking, and DTC literatures, prior knowledge is important in understanding behavior. Prior knowledge significantly impacts information-seeking activities (based on recent prior knowledge consumer behavior and information-seeking findings), which varies by prior knowledge

dimensions (Raju, Lonial & Mangold, 1995). Previous consumer behavior research has not yet investigated the effects of prior knowledge dimensions on disease prevention behaviors. Understanding how an individual's prior knowledge set affects his/her health-related behavior, is an important step in the health communication process, and vital for the successful implementation of a DTC or public health promotion campaign. Based on the forgoing discussion, the following chapter (Chapter Four) advances the hypotheses investigated in the present study.

Chapter Four: Hypotheses

As discussed in previous chapters, the present study investigates the impact of six dimensions of prior knowledge (discussed in Chapter Two) on health-related behaviors (discussed in Chapter Three). According to the literature review in the previous chapter (Chapter Three), regarding the relationship between prior knwoeldge and health-related behaviors (more specifically information-seeking and disease prevention behaviors), this chapter (Chapter Four) advances the hypotheses examined in the present study. The proposed relationships between six dimenions of prior knowledge) and both information-seeking and disease prevention behaviors can be seen in Figure 5, and are organized in sequence according to Table 3.

4.1. KNOWN "TRUE" KNOWLEDGE

No hypotheses are offered for the known "true" knowledge dimension of prior knowledge. It is a construct known from external factual information (e.g., the number of people in the USA as counted by the census would be "true" knowledge that might be compared against a person's subjective perceptions of this number). It is not relevant here to hypothesize about what is "truth". "Truth" will be used to measure the accuracy of a person's perceptions of the truth (represented by knowledge test score).

4.2. KNOWLEDGE TEST SCORE

Though the relationship between the results of a knowledge test score and information search has found significant support (cf., Brucks 1985; Raju, Lonial and Mangold 1995; Moorman et al. 2004; Carlson et al. 2009), the nature of that relationship varies across studies, empirically. Yet, studies consistently suggest that consumers with

moderate knowledge are more likely to engage in external search behaviors than are low knowledge consumers (Raju, Lonial and Mangold, 1995). There is no consistency for the search behavior of high knowledge people (Bettman and Park 1980; Johnson and Russo 1984; Punj and Staelin 1983; Raju, Lonial and Mangold 1995). Some studies show a positive linear relationship between high knowledge test scores and information search (Johnson and Russo 1984; Raju, Lonial and Mangold 1995), while others show a negative linear relationship (Moore and Lehman 1980).

Golden and Stanaland (2000), who looked at the relationship between knowledge test score and information receptivity within a health context (AIDS), also found a positive and significant relationship. Since the present study also examines prior knowledge within a health context, it is posited that knowledge will beget knowledge (Golden & Stanaland, 2000). People who know more do so because they are tuned into obtaining updated information. Thus, high knowledge individuals will continue to be knowledge seekers. These high knowledge individuals will perform the most information search, and low knowledge test score individuals the least information search (Golden & Stanaland, 2000). Therefore, a significant and positive relationship between knowledge test score and information-seeking intentions is hypothesized.

H1: There will be a significant and positive relationship between knowledge test score results and information-seeking intentions.
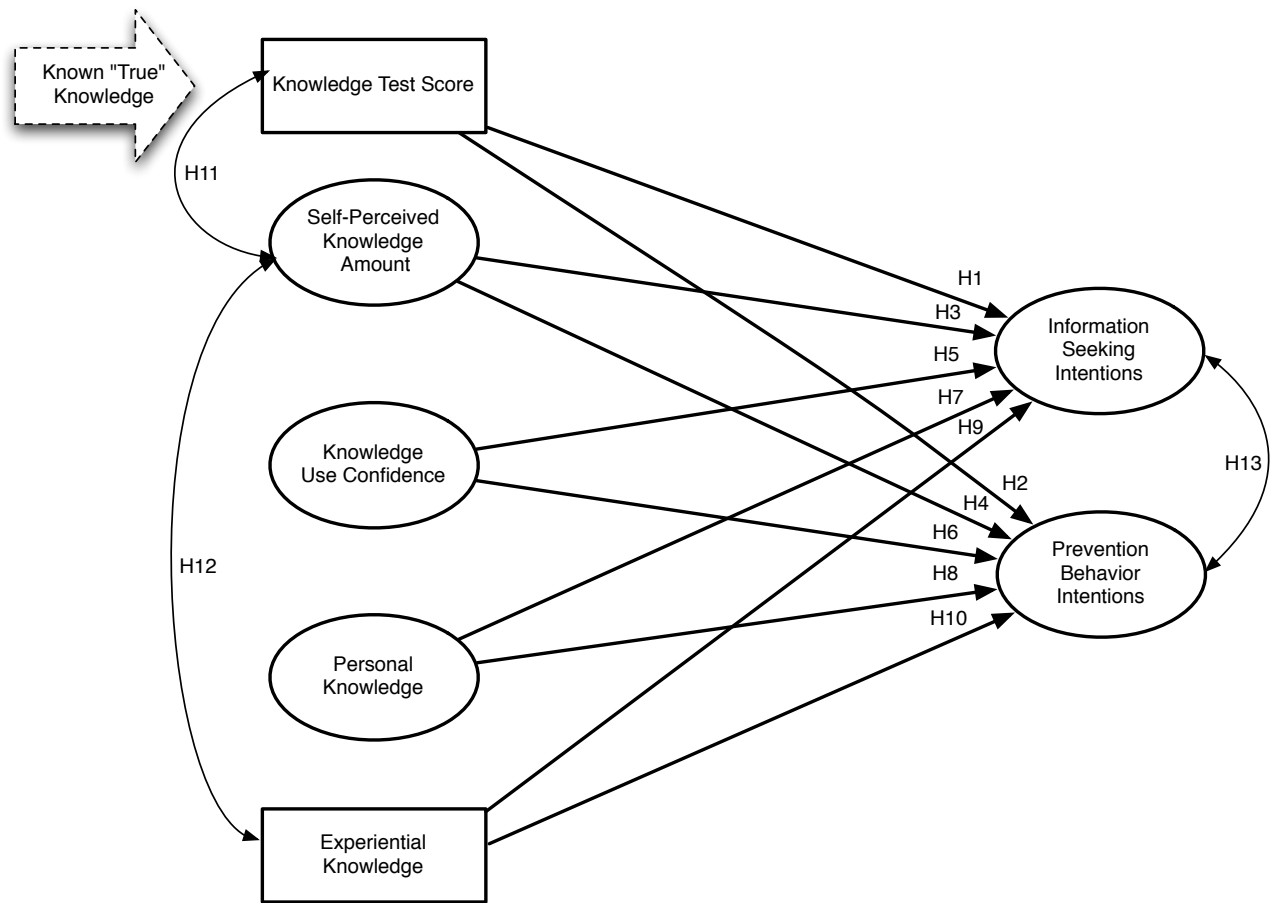
----- Arrow ---- Represents known "true" knowledge, which is used for the calculation of the knowledge test score. No hypotheses are offered for the known "true" knowledge dimension of prior knowledge. It is a construct known from external factual information.

Figure 5:   Hypothesized Model

On the contrary, high levels of knowledge test score do not necessarily mean that prevention behavior will be consistent with that knowledge or that there will be a change in the behavior as a result of that knowledge. According to the Transtheoretical Model (a.k.a. Stages-of-Change) (Prochanska, 1992) individuals may not be committed to change their health-related behavior or take the recommended health-related behavioral action, even when knowledgeable about a health risk. This implies that even if individuals have high knowledge test scores, it does not mean that they will energize

action or change their behavior. Thus, no significant relationship between the knowledge

test score and health-related behavioral intentions is predicted.

H2: There will be no significant relationship between knowledge test score results and behavioral intentions.

4.3. SELF-PERCEIVED KNOWLEDGE AMOUNT

There is a strong link between self-perceived knowledge amount and information

search (cf., Brucks 1985; Raju, Lonial, and Mangold 1995; Moorman et al. 2004; Carlson

et al. 2009). Prior empirical studies suggest that self-perceived knowledge amount

facilitates the use of knowledge already stored in memory (Rudell 1979). Others report an

inverted-U relationship between self-perceived knowledge amount and information

search (Raju, Lonial, and Mangold, 1995). Based on Raju, Lonial, and Mangold (1995),

consumers with moderate levels of self-perceived knowledge amount (how much they

think they know) will be more likely to seek information, since they have both the ability

and motivation to seek information (Raju, Lonial, & Mangold, 1995). Consumers with

high levels or low levels of self-perceived knowledge amount will be less likely to seek

information as they lack the motivation or the ability to seek that information (Raju,

Lonial, & Mangold, 1995). Therefore, a significant and inverted-U relationship between

self-perceived knowledge amount and information-seeking intentions is hypothesized.

H3: There will be a significant inverted-U relationship between self-perceived knowledge amount and information-seeking intentions.

Individuals who perceive themselves to be highly knowledgeable may be

evidencing their desires to control or prevent an event through knowledge acquisition.

According to the Extended Parallel Processing Model (EPPM) (Witte, 1992), individuals

who perceive a threat will either be motivated towards "danger control" or "fear control".

"Danger control" implies that the individual will try to change his/her behavior to prevent susceptibility to the perceived threat. On the contrary, "fear control" implies that the individual will try to control his/her fear and try to ignore the matter overall, instead of taking prevention-related measures (Witte, 1992). Individuals who perceive themselves to be highly knowledgeable are motivated towards danger control and will engage in prevention-related behaviors more than will individuals with low self-perceived knowledge amount, consistent with the EPPM. Alternatively, individuals with low self-perceived knowledge amount may be motivated by fear; they will shut down to information as well as behaviors. Thus, a significant and positive relationship is predicted between self-perceived knowledge amount and behavioral intentions.

> **H4:** There will be a significant positive relationship between self-perceived knowledge amount and behavioral intentions.

4.4. KNOWLEDGE USE CONFIDENCE

The present study examines knowledge use confidence as a separate conceptualization of prior knowledge, and predicts that knowledge use confidence will also have a significant inverted-U relationship with information-seeking intentions (as self-perceived knowledge amount does). If a consumer has a high level of confidence in their current knowledge use, they will not be motivated to seek additional information. However, if a consumer has a low level of confidence in their use of current knowledge the consumer will not perceive that he/she has the ability to seek that information. Therefore, only the consumers with a moderate level of confidence in their knowledge will have both the ability and motivation to seek information.

> **H5:** There will be a significant inverted-U relationship between knowledge use confidence and information-seeking intentions.

Likewise, the same inverted-U relationship is expected with behavioral intentions. Consumers with moderate levels of confidence will have the highest propensity for prevention behavior.

H6: There will be a significant inverted-U relationship between knowledge use confidence and behavioral intentions.

4.5. PERSONAL KNOWLEDGE

To date, the personal knowledge construct has not been empirically investigated. The higher the personal knowledge (what applies to the self for the person's own behavior), the more likely that information will be acted on. Consistent with this prediction, the higher the personal knowledge, the higher the disease prevention behavior will be.

H7: There will be a significant positive relationship between personal knowledge and information-seeking intentions.

H8: There will be a significant positive relationship between personal knowledge and behavioral intentions.

4.6. EXPERIENTIAL KNOWLEDGE

Experiential knowledge has a significant and negative relationship with information-seeking (Raju, Lonial & Mangold, 1995). Consumers who have extended experience with a health issue, will be less likely to seek additional information, as they would know a lot about the specific health issue. Therefore, a significant and negative relationship is predicted between experiential knowledge and information-seeking intentions.

H9: There will be a significant negative relationship between experiential knowledge and information-seeking intentions.

However, consumers who have a lot of experience with a health issue, such as having a friend or relative who experienced the complications of the specific health threat, will be more likely to take prevention measures, compared to those who have no experience with the health issue. Therefore, a significant and positive relationship between experiential knowledge and behavioral intentions is hypothesized.

H10: There will be a significant positive relationship between experiential knowledge and behavioral intentions.

4.7. CORRELATION BETWEEN KNOWLEDGE TEST SCORE AND SELF-PERCEIVED KNOWLEDGE AMOUNT

Knowledge test score usually has a positive and significant relationship with self-perceived knowledge amount (Carlson, 2009). This relationship implies that the more someone knows, the more he/she perceives that he/she knows. On the contrary, if someone has a low knowledge test score, the less self-perceived knowledge amount he/she will have. Therefore, knowledge test score and self-perceived knowledge amount will be significantly and positively correlated.

H11: There will be a significant positive correlation between knowledge test score and self-perceived knowledge amount.

4. 8. CORRELATION BETWEEN SELF-PERCEIVED KNOWLEDGE AMOUNT AND EXPERIENTIAL KNOWLEDGE

Experiential knowledge also tends to have a positive and significant relationship with self-perceived knowledge amount (Raju, Lonial & Mangold, 1995), because the more experience an individual has the more the individual will think he or she knows.

Therefore, self-perceived knowledge amount will be positively correlated with experiential knowledge.

> **H12:** There will be a significant positive correlation between self-perceived knowledge amount and experiential knowledge.

4.9. CORRELATION BETWEEN INFORMATION-SEEKING AND BEHAVIORAL INTENTIONS

It is quite common for DTC advertising-related studies to consider information-seeking as a prevention behavior (e.g., Manika, Ball, & Stout, 2010; Ball, Stout, & Manika, 2009; Manika & Mackert, 2010). Therefore, it can be hypothesized that information-seeking and prevention behaviors will be positively and significantly related. The more likely someone is to seek additional information, the more likely he/she will take prevention measures. Thus, information-seeking intentions will be positively and significantly correlated with prevention behaviors.

> **H13:** There will be a significant positive correlation between information-seeking intentions and behavioral intentions.

The methodology used to examine hypotheses one to thirteen is discussed in the following chapter (Chapter Five). In addition, a summary of the HPV (the selected case of the present study) DTC literature is provided, followed by a discussion of the Internet survey delineated in the present study. The main study's survey measures are presented after preliminary analyses based on the pretest results are conducted and necessary changes are made to the original questionnaire. Lastly, Chapter Five offers sample descriptive statistics, for both the pretest and main study.

Chapter Five: Methodology

This chapter covers the methodology used to examine the relationship between the six dimensions of prior knowledge and the outcomes of both information-seeking and prevention behavior intentions. In order to examine the hypothesized relationships discussed in the previous chapter (Chapter Four), the case of the HPV vaccine is employed. The following section features a review of the case of the HPV vaccine and the reason behind the selection of this case for the examination of the hypothesized relationships. A description of the pretest and the preliminary analyses follow. This chapter concludes with the main study design and the key measures employed for the main study data collection.

5.1. THE CASE OF THE HPV VACCINE

Human papillomavirus (HPV) is currently one of the most common sexually transmitted diseases in the United States (Boskey, 2009). In the United States, approximately 20 million people have HPV, and another 6.2 million people become infected each year (Medical News Today, 2006; CDC Fact Sheet, 2007). Most individuals who have HPV do not realize they are infected (American Cancer Society, 2009). HPV has no symptoms with the exception of one type of HPV, which causes genital warts (American Cancer Society, 2009). At least 50% of sexually active people will have genital HPV at some time in their lives (CDC HPV Fact Sheet, 2010). HPV usually goes away on its own, but "*rarely, these types can also cause warts in the throat -- a condition called recurrent respiratory papillomatosis or RRP. Other HPV types can cause cervical cancer. These types can also cause other, less common but serious*

cancers, including cancers of the vulva, vagina, penis, anus, and head and neck (tongue, tonsils and throat)" (CDC HPV Fact Sheet, 2010).

In 2006 an HPV vaccine became available for young women ages 9 to 26 years old (CDC, 2010). Today, the HPV vaccine is "*available for males and females to protect against the types of HPV that most commonly cause health problems. Two vaccines (Cervarix and Gardasil) are available to protect females against the types of HPV that cause most cervical cancers. One of these vaccines (Gardasil) also protects against most genital warts*" (CDC Fact Sheet, 2010) in females. Gardasil is the only available vaccine that also protects males against most genital warts (CDC Fact Sheet, 2010).

Gardasil was the first HPV vaccine to become available to consumers. Since Gardasil's introduction to the public in 2006, it has been aggressively promoted to young individuals and to parents of young boys and girls through a series of direct-to-consumer (DTC) advertisements. In fact, DTC promotion of Gardasil was the chief factor behind a 21% increase in Merck marketing and administrative expenses for the fourth quarter of 2006 (Arnold, 2007). Gardasil DTC advertising messages often feature sources where consumers can seek additional information about Gardasil and HPV related issues, in addition to the prevention message itself. These advertisements make HPV an appropriate case for examining the differential effects of prior knowledge on health information-seeking and prevention behavior intentions.

Prior research on HPV has been rather vast but mostly focused on awareness of the HPV vaccine in females, since only recently (in 2009) did the vaccine become available for males. A limited number of studies have looked at Gardasil DTC advertising. Manika and Mackert (2010), provided some insights into consumers'

thinking and decision-making process as they responded to Gardasil's "I Chose" campaign, which includes two TV commercials and a website. This campaign was found to be effective in raising awareness about HPV, cervical cancer, and genital warts. The campaign motivated young women and parents of young girls to visit Gardasil' website. Even though the campaign may have been a good integration between television and digital components, the authors suggest that future research is needed to improve campaigns of this kind and to increase effectiveness in motivating Gardasil vaccination (Manika & Mackert, 2010).

Manika, Ball and Stout (2010) explored how college women respond to DTC advertising for an HPV vaccine. The researchers examined key elements, drawn from commonly used health related theories, to determine the strongest predictors of behavioral intentions. Findings indicated that vaccinated women were more influenced by DTC advertising than those who were not vaccinated. The women's attitudes toward and trust of advertising for the vaccine significantly predicted their intentions to seek more information about the vaccine. The study also found that perceived barriers had the only significant effect on behavioral intentions, when taking into account perceived threat and response efficacy (Manika, Ball, & Stout, 2010).

In addition, Buttweiler (2009) conducted a rhetorical analysis of the Gardasil campaign and found that the messages contain elements of perceived threat, efficacy, and barriers as related to health theory. Ngondo (2009) further found a lack of balance between the threat and efficacy components of the ads, with greater emphasis on the efficacy of Gardasil.

While these studies shed some light on the promotion tactics of the vaccine, they did not explore the effects of the different types of HPV-related knowledge on information-seeking intentions and prevention behavior. Understanding the prior knowledge set of the target audience and its effects on information-seeking and prevention behavior can benefit health communicators, who continually try to understand consumers' choices in a deeper level. In addition, the heavy use of DTC advertising to promote Gardasil provides an opportunity to better understand how younger consumers are more likely to respond to DTC advertising based on their prior knowledge set, since the majority of targeted DTC advertising and research has focused on older adults (DeLorme, Huh, and Reid 2007; Jones and Mullan 2006; Huh, DeLorme, and Reid 2004).

5.2. STUDY DESIGN

A self-administered online Internet survey was created for the data collection. A pretest preceded the main survey. Internet data collection, for both the pretest and the main survey shortly after, was conducted during March 2011, using email addresses rented from an online Internet consumer panel in the USA. The sample frame consisted of a sub-set of qualified participants in the Internet survey panel selected at random by the company administering the panel (the company was called Authentic Response). Potential respondents were invited to fill out the survey via email. Identities and emails of respondents remained confidential as they were owned by the panel company compiling them—the researcher "rents" the emails for survey purposes.

The sample frame was specified to include males and females between the ages of 18 to 26 years old, living in the USA. The age restriction for the sample was vital for this

particular case, due to the FDA's restriction regarding the administration of the Gardasil HPV vaccine. It was also specified with the panel company for the sample to be geographically and demographically dispersed. As is typical in Internet surveys of this type, data collection is terminated when the purchased number of respondents have completed the survey.

5.2.1. Pretest

A self-administered Internet questionnaire was developed and pretested shortly before the final instrument was fielded. For the pretest, participants were invited to fill out the survey via an email invitation. By clicking on the survey link, included in the email invitation, they were redirected to the survey's welcome page. The welcome page of the survey featured a short description of the purpose of the survey, as well as the conditions under which the survey would be completed. Participants were asked to click the "next" button, as a form of informal consent, if they agreed with the conditions of the survey and were willing to participate in the survey. Participants could also withdraw from the survey at any time, and were also given the "do not wish to disclose" option for any questions, they did not wish to answer.

The independent and dependent variables of the hypothesized relationships (shown in Figure 5) are depicted in Table 4. The questionnaire used for the pretest included 88 items and is shown in Appendix A. Respondents first answered questions regarding their self-perceived knowledge amount, their knowledge use confidence, their personal knowledge and their experiential knowledge, all on 7-point bipolar adjective scales. They were then asked to answer a series of questions regarding HPV to gauge the accuracy of their knowledge. Next, the questionnaire gauged participants' information-

seeking intentions, information-seeking source preferences, and prevention behavior intentions, which were also measured on a 7-point bipolar adjective scale. The pretest's questionnaire ended with a few demographic questions.

IVs	DVs
Knowledge Test Score	Information-seeking Intentions
Self-perceived Knowledge Amount	Prevention Behavior Intentions
Knowledge Use Confidence	
Personal (Internalized) Knowledge	
Experiential Knowledge	

Table 4:   Independent and Dependent Variables

Most scales were adapted from already established scales from prior literature. However, it should be noted that the scales were modified prior to the pretest in order to fit the health related topic examined in this research, since most scales were originally created for product situations. Therefore, even though the scales came from prior literature, it was expected that significant changes would be made to the measures themselves, prior to the administration of the main survey.

The pretest was administered to 106 participants (no eliminations were made to the sample). Table 5 shows the descriptive statistics of the pretest sample. From the 106 participants who completed the pretest survey, 45.3% were female and 54.7% were male, with an average age of 21 years old (SD=2.66). Most of the pretest participants (35.8%) had some college but no degree, followed by a 27.4% who graduated from high school or

		Frequency	Percentage
Gender (N=106)			
	Male	48	45.3%
	Female	58	54.7%
Age (N=104)	18-20	43	41.3%
	21-23	29	27.9%
	24-26	32	30.8%
Education (N=106)	Some high school or less	9	8.5%
	High school graduate or equivalent	29	27.4%
	Vocational/technical school (two year program)	1	.9%
	Some college but no degree	38	35.8%
	College graduate (four year program)	22	20.8%
	Some graduate school	5	4.7%
	Professional degree (M.D., J.D., etc.)	2	1.9%
Ethnicity (N=104)	African American	11	10.6%
	Native American	10	9.6%
	Anglo American	45	43.3%
	Asian American	10	9.6%
	Hispanic American	8	7.7%
	Multiracial	9	8.7%
	Non-USA Native	7	6.7%
	Other ("Caucasian", "White", "good listener")	4	3.8%
Household Income (N=106)	Less than $15,000	25	23.6%
	$15,000 to $24,999	6	5.7%
	$25,000 to $34,999	9	8.5%
	$35,000 to 49,999	22	20.8%
	$50,000 to 74,999	25	23.6%
	75,000 to 99,999	7	6.6%
	$100,000 to $149,999	8	7.5%
	$150,000 or more	4	3.8%
Health Status (N=105)	Poor	1	1.0%
	Fair	9	8.6%
	Good	40	38.1%
	Very Good	41	39.0%
	Excellent	14	13.3%

Table 5:   Pretest Descriptive Statistics

equivalent. Almost half of the pretest participants (45.2%) were Anglo American, followed by a 10.4% of African Americans, a 9.4% of Asian Americans, and a 9.4% of Hispanic Americans. Average income was $25,000 to $34,999 (SD=2.05) and most participants (38.7%) described their health as "very good", followed by a 37.7% who described their health as "good".

It is also important to note that only 22.6% of the pretest participants had been vaccinated against HPV, and most of them have been vaccinated with Gardasil (71.9% out of the vaccinated participants). Most participants (85.8%) had never been diagnosed with HPV. In addition, a 35.8% knew someone who had been vaccinated against HPV, and 16% knew someone who has or has had HPV. Almost half (48.1%) of the pretest participants had seen a Gardasil advertisement, and more specifically most of them (88.5% out of the participants who had seen a Gardasil advertisement) had seen the Gardasil advertisement on TV.

After the pretest data collection was complete the Statistical Package for the Social Sciences (SPSS) was used to run preliminary analysis on the pretest results. Cronbach's alphas were calculated for each construct depicted in Table 4, in order to test the reliability of the measures. In addition an exploratory factor analysis was conducted (varimax rotation) to gauge the consistency of constructs with theoretical concepts.

Construct measures were modified based on the scale reliabilities (Cronbach's Alphas) and the exploratory factor analyses (EFA). The resulting scales are shown in Table 6, along with the EFA loadings and the Cronbach's alphas. All resulting scales had a Cronbach's alpha greater than .87, meaning that all resulting scales were highly reliable based on the commonly used cutoff value of .80. The exploratory factor analysis showed

that the resulting scales all loaded on one factor, with a highly significant Bartlett's Test of Sphericity (see Table 6). After verifying the validity of the scales, the resulting scales were used to create the questionnaire for the main data collection. The main study's questionnaire is shown in Appendix B.

5.2.2. Main Study

The same procedure as with the pretest was employed for the data collection of the main study. Email invitations were sent to participants by the panel company with the survey link, which redirected participants to the welcome page of the survey. The "next" button was once again used as a form of informal consent. Participants were asked to answer questions about their self-perceived knowledge amount, knowledge use confidence, personal knowledge, and experiential knowledge; followed by the series of questions to test the accuracy of participants' HPV knowledge. The survey also gauged participants' information-seeking intentions, information-seeking source preferences, and prevention behavior intentions, in addition to a few demographic questions. Survey measures for the main study's questionnaire are shown in Appendix B and described in more detail in a following section (5.2.2.1.).

The panel company sent out 10,800 email invitations for the main study data collection to prospective participants, of which 1,707 participants filled out the survey. The resulting sample size was 1,476 participants, since the rest were called "incomplete surveys". Descriptive statistics of the main study's sample are shown in Table 7. From the 1,476 participants 48.4% were male and 51.6% were female, with an average age of 22 years old (SD=2.76). Most participants (39.2%) had some college but no degree,

Variables, Measures, & Sources	Pretest EFA loadings	Pretest Reliability	N
Self-perceived Knowledge Amount (Modified and adapted from Burton, Garretson, & Velliquette, 1999)	KMO .816*	a=.94	105
In general, how much do you think you know about…			
…HPV.[a]	.891		
…how to protect yourself from HPV.[a]	.843		
…the potential health consequences of having HPV.[a]	.867		
Compared to most people, I am quite knowledgeable about…			
…HPV.[b]	.874		
…how to protect yourself from HPV.[b]	.919		
…the potential health consequences of having HPV.[b]	.915		
Knowledge Use Confidence (Adapted from Moorman et al., 2004)	KMO .765*	a=.95	104
How confident do you feel about your ability to…			
…make HPV prevention choices?[c]	.958		
…use your knowledge of HPV in making prevention choices?[c]	.964		
…use your knowledge of HPV in making every day activity choices?[c]	.942		
Personal Knowledge (Own Development)	KMO .862*	a=.95	104
To what extent do you personally feel you are at risk of being infected with HPV?[d]	.896		
How severe a threat is HPV to you personally?[e]	.888		
In general, the HPV topic is very relevant to me personally.[e]	.913		
Do you actively engage in any behaviors that might put you at risk of getting HPV?[e]	.884		
I believe I am personally at risk for getting infected with HPV.[d]	.908		
To what extent does the HPV topic apply to your own health care decision-making personally?[e]	.891		

Table 6:   Pretest Reliabilities and EFA loadings

Variables, Measures, & Sources	Pretest EFA loadings	Pretest Reliability	N
Information-seeking Intentions (Modified and adapted from Manika & Golden, 2010)	KMO .854*	a=.93	104
I intend to seek Gardasil related information.[b]	.854		
I intend to actively search for information about HPV.[b]	.933		
I like having information about HPV.[b]	.927		
I intend to actively seek information on how to prevent myself from getting infected with HPV.[b]	.835		
Prevention Behavior Intentions (Modified and adapted from Manika & Golden, 2010)	KMO .644*	a=.87	105
It is important to me to do everything I reasonably can to avoid getting infected with HPV.[b]	.935		
I will do all I know to do to prevent myself from getting infected with HPV.[b]	.948		
I will change my behavior to try to avoid getting infected with HPV.[b]	.780		
Health Professionals as a Source of Information-seeking (Own Development)	KMO .869*	a=.97	105
In the future, how likely are you to talk to A HEALTH PROFESSIONAL about…			
…HPV?[f]	.951		
…how to protect yourself from HPV?[f]	.962		
…potential health consequences of having HPV?[f]	.946		
…Gardasil?[f]	.929		
Friends/Family as a Source of Information-seeking (Own Development)	KMO .823*	a=.97	105
In the future, how likely are you to talk to your FRIENDS/FAMILY about…			
…HPV?[f]	.964		
…how to protect yourself from HPV?[f]	.971		
…potential health consequences of having HPV?[f]	.964		
…Gardasil?[f]	.939		

Table 6:   Pretest Reliabilities and EFA loadings (continued)

Variables, Measures, & Sources	Pretest EFA loadings	Pretest Reliability	N
The Internet as a Source of Information-seeking (Own Development)	KMO .870	a=.97	105
In the future, how likely are you to search THE INTERNET for…			
…HPV-related information?[f]	.981		
…information on how to protect yourself from HPV?[f]	.966		
…potential health consequences of having HPV?[f]	.956		
…Gardasil?[f]	.952		
The Media as a Source of Information-seeking (Own Development)	KMO .868*	a=.97	105
In the future, how likely are you to seek information through THE MEDIA about…			
…HPV?[f]	.975		
…how to protect yourself from HPV?[f]	.977		
…potential health consequences of having HPV?[f]	.922		
…Gardasil?[f]	.963		
Intrapersonal (Internal) Information as a Source of Information-seeking (Own Development)	KMO .869*	a=.96	105
In the future, how likely are you to RELY ON WHAT YOU ALREADY KNOW, without doing any additional search for information or talking to someone about…?			
…HPV-related information?[f] ®	.963		
…how to protect yourself from HPV?[f] ®	.907		
…potential health problems of HPV?[f] ®	.965		
…Gardasil?[f] ®	.948		

Table 6:   Pretest Reliabilities and EFA loadings (continued)

Notes: ® Reverse Coded,[a] 7-point bipolar adjective scale (1=Nothing, – 7= A Lot),[b] 7-point bipolar adjective scale (1=Strongly Disagree – 7= Strongly Agree),[c] 7-point bipolar adjective scale (1=Confident – 7= Not Confident),[d] 7-point bipolar adjective scale (1=At no risk – 7= At great risk),[e] 7-point bipolar adjective scale (1=Not at all – 7= A Lot),[f] 7-point bipolar adjective scale (1=Extremely Likely – 7= Extremely Unlikely), * p=.000.

	Frequency	Percentage
Gender (N=1476)		
Male	714	48.4%
Female	762	51.6%
Age (N=1468)		
18-20	588	40.0%
21-23	408	27.8%
24-26	472	32.2%
Education (N=1468)		
Some high school or less	99	6.7%
High school graduate or equivalent	348	23.6%
Vocational/technical school (two year program)	55	3.7%
Some college but no degree	585	39.9%
College graduate (four year program)	244	16.6%
Some graduate school	45	3.2%
Graduate degree	69	4.7%
Professional degree (M.D., J.D., etc.)	20	1.4%
Other ("finished", "white", "good")	3	.2%
Ethnicity (N=1453)		
African American	152	10.5%
Native American	67	4.6%
Anglo American	503	34.6%
Asian American	111	7.6%
Hispanic American	132	9.1%
Multiracial	100	6.9%
Non-USA Native	59	4.1%
Other ("Caucasian", "white", "Black", etc.)	329	22.6%
Household Income (N=1461)		
Less than $15,000	266	18.2%
$15,000 to $24,999	200	13.7%
$25,000 to $34,999	216	14.8%
$35,000 to 49,999	256	17.5%
$50,000 to 74,999	259	17.7%
75,000 to 99,999	129	8.8%
$100,000 to $149,999	88	6.0%
$150,000 or more	47	3.2%
Health Status (N=1468)		
Poor	16	1.1%
Fair	151	10.3%
Good	544	37.1%
Very Good	524	35.7%
Excellent	233	15.9%

Table 7:   Main Study Descriptive Statistics

followed by a 23.4% who graduated from high school or equivalent. Half of the participants (50.2%)were Anglo American, followed by a 10.3% of African Americans. Average income was $25,000 to $34,999 (SD=2.05) and most participants (36.9%) described their health as "good", followed by a 35.5% who described their health as "very good".

It is also important to note that only a 25.8% of the participants had been vaccinated against HPV, but most of those have been vaccinated with Gardasil (70.5% out of the vaccinated participants). Most participants (86%) had never been diagnosed with HPV, followed by a 5.9% who have had HPV, and 5.1% who did not know whether or not they have had HPV. 2.4% of the sample wished not to disclose this information. In addition, 37% knew someone who had been vaccinated against HPV, and 18.7% knew someone who has or has had HPV. Almost half (49%) of the participants had seen a Gardasil advertisement, and more specifically most of them (89.4% out of the participants who had seen a Gardasil advertisement) had seen the Gardasil advertisement on TV. Lastly, 80.2% of those who had been vaccinated with Gardasil, had seen a Gardasil advertisement.

By comparing Tables 5 and 7, it is evident that the pretest sample and the main study sample were similar. Both samples were representatives of the general population in the US, in terms of age (given that there was an age restriction for the data collection due to FDA regulations regarding the administration of the HPV vaccine), education, income, and ethnicity (according to US Census Demographic Statistics). In addition (as requested from the panel company), both had a balance of females and males (with a few more females, as in the general US population, according to the US census demographic

statistics). Participants from both samples described their health as "good" and "very good", as well as most participants had never been diagnosed with HPV. Both pretest and main study participants had seen a Gardasil DTC advertising message, and had moderate knowledge of HPV.

5.2.2.1. Survey Measures

The questionnaire used for the main data collection included 74 items. The following sub-sections describe the scales that were used in the main study to measure each variable identified in Table 4. The main survey questionnaire is shown in Appendix B. Scale reliabilities and descriptive statistics of the constructs are shown in Table 8.

5.2.2.1.1. Self-perceived Knowledge Amount (SPK)

The first part of the questionnaire gauged the participant's self-perceived knowledge about HPV, HPV prevention, and the potential health problems of HPV, via 6 items. Participants were asked to indicate on a scale of 1 (nothing) to 7 (a lot) how much they thought they knew about HPV, HPV prevention, and the potential health problems of HPV and to rate on a scale of 1(strongly disagree) to 7 (strongly agree) how much they agreed with the statement "Compared to most people I am quite knowledgeable about… HPV, HPV prevention, and the potential health problems of HPV"). The self-perceived knowledge scale was modified and adapted from Burton, Garretson and Velliquette (1999). Even though the resulting scale was significantly different from the original scale, it was found to be reliable with a Cronbach's alpha of .95. As stated previously in this chapter adapted scales were expected to be modified significantly since they were originally created for product situations, instead of health-related situations, such as HPV.

5.2.2.1.2. Knowledge Use Confidence (KUC)

The questionnaire then asked participants to rate their confidence in using their knowledge about HPV, HPV prevention, and the potential health problems of HPV, on a scale of 1 (confident) to 7 (not confident). This scale was adapted by Moorman et al., (2004) and it did not change significantly since it was originally created for nutritional information, which is a health-related topic. The resulting scale had a Cronbach's alpha of .96, which is consistent with prior uses of this scale.

5.2.2.1.3. Personal (Internalized) Knowledge (PK)

Personal (internalized) knowledge was measured via a 6-item scale. Participants were first asked to rate their personal risk of getting infected with HPV and rate the statement "I believe I am personally at risk for getting infected with HPV", on a scale of 1(At no risk) to 7 (At great risk). Then the questionnaire asked them to rate and how severe a threat is HPV to them personally, to what extent HPV is relevant to them, to what extent they engage in behaviors that might put them at risk of getting HPV and to what extent the HPV topic applies to their health care decisions. These statements were measured on a 7-point bipolar adjective scale ranging from 1(Not at all) to 7 (A lot). This scale was developed by the author since prior literature had not measured personal knowledge prior to this study. The scale had high reliability with a Cronbach's alpha of .90.

5.2.2.1.4. Experiential Knowledge (EK)

Experiential knowledge was measured via 7 items and was developed by the author for the present study. The participants were asked whether or not they or someone they personally knew has been vaccinated against HPV, diagnosed with HPV, has had

HPV, or has seen a Gardasil advertisement about the HPV vaccine. This construct was measured as a categorical variable (Yes, No, Don't know/Do not wish to disclose). For the analysis the "Yes" answers were coded as 1, and all other responses as 0. The scores from each statement were then added to create a composite score of experiential knowledge. The higher the individual's score, the greater experience he/she would have.

Even though some of these statements do not have equal weights (some are more important than others), there is an advantage to using composite scores/indexes (accumulating scores assigned to individual attributes) (Babbie, 1990). Composite scores/indexes represent a more general dimension, as opposed to a specific dimension measured by a scale, which allows more information to be collected. In addition, composite scores/indexed are used with categorical variables, such as experiential knowledge. Lastly, each item measuring experiential knowledge was theoretically and logically to ensure the internal validity of the scale (as per Babbie, 1990). Inter-correlations were also computed to test the external validity of the scale (as per Babbie, 1990). There was no inter-correlation above .80, which means that the composite score/index also had external validity (as per Babbie, 1990).

5.2.2.1.5. Knowledge Test Score

Next, participants were asked to answer a series of questions about HPV to measure their knowledge accuracy. The HPV knowledge test (which was part of the main study's survey as shown in Appendix B) consisted of 15 items (15 items is the common number of questions for knowledge tests based on relevant prior knowledge consumer behavior literature – see Moorman et al. 2004), which were coded as 1 for a correct answer and 0 for an incorrect answer. All items were summed to create the composite

score. This part of the questionnaire was developed based on the CDC information about HPV and then verified by Gulielma Leonard Fager, MPH and Healthy Sexuality Education Coordinator at The University of Texas at Austin, to ensure the accuracy of the correct answers (the correct answers to the knowledge test score are shown in Appendix C). The correct answers were used as the 100% stated known "true" knowledge in order to measure the accuracy of the participant's knowledge (knowledge test score). The closer an individual is to the 100% stated known true knowledge, the more knowledgeable he/she is. Known "true" knowledge comes from facts, therefore, was not measured.

5.2.2.1.6. Information-seeking Intentions (IS)

Information-seeking intentions were measured via 4 statements that participants were asked to rate on a scale of 1(Strongly Disagree) to 7 (Strongly Agree). The four statements were "I intend to seek Gardasil related information", "I intend to actively search for information about HPV", "I like having information about HPV", and "I intend to actively seek information on how to prevent myself from getting infected with HPV". This scale was modified and adapted from Manika & Golden (2010). The Cronbach's alpha for the refined information-seeking intentions scale was .90, which is consistent with prior literature.

5.2.2.1.7. Information Source Preference

The questionnaire also gauged participants' information source preferences. Participants were asked to rate on a scale of 1(Extremely Likely) to 7 (Extremely Unlikely), how likely they were to search for additional information, via health professionals, friends/family, the Internet, and the media, or just rely on what they

already know about HPV, HPV prevention, the potential health problems of HPV, and Gardasil. The scales for each information source was developed by the author for the present study (based on Kahlor, 2010; Manika & Golden, 2010; Ball, Manika & Stout, 2010). Each information source scale included 4 items (20 in total), and had a Cronbach's alpha of .95 and above (see Table 6 for each source's Cronbach's alpha).

5.2.2.1.8. Prevention Behavior Intentions (PBI)

Lastly, the questionnaire also gauged the participants' prevention behavior intentions via 3 items, on a scale of 1 (strongly disagree) to 7 (strongly agree). The statements included were "It is important to me to do everything I reasonably can to avoid getting infected with HPV", "I will do all I know to do to prevent myself from getting infected with HPV", and "I will change my behavior to try to avoid getting infected with HPV". The scale was modified and adapted from Manika and Golden (2010) and resulted in a Cronbach's alpha of .87.

5.2.2.1.9. Demographics

The final part of the questionnaire asked participants to answer a few questions regarding their age, gender, education level, ethnicity, household income and their health status perceptions. Lastly, the participants were able to write any additional thoughts they had about HPV or Gardasil or the questionnaire itself. This was an open-ended question that was used to determine whether or not there were any issues with the questionnaire or any thoughts about HPV that were not taken into account. All comments were quite positive in terms of raising awareness about this important health-related issue and no problems understanding the questionnaire were found.

CONSTRUCTS	Reliability	N	M	SD	Min	Max
Self-perceived Knowledge Amount (SPK)	a=.95	1476	3.61	1.77	1	7
Knowledge Use Confidence (KUC)	a=.96	1476	3.73	2.00	1	7
Personal Knowledge (PK)	a=.90	1474	2.65	1.34	1	7
Information-seeking Intentions (IS)	a=.90	1470	3.81	1.59	1	7
Prevention Behavior Intentions (PBI)	a=.87	1471	4.7	1.69	1	7
Actual "True" Knowledge Test Score (Test)	--	1474	7.09	4.35	0	15
Experiential Knowledge (EK)	--	1424	1.89	1.91	0	7
Health Professionals as a Source of Information-seeking (HP)	a=.95	1473	4.08	1.91	1	7
Friends/Family as a Source of Information-seeking (FF)	a=.96	1470	4.33	1.94	1	7
The Internet as a Source of Information-seeking (Web)	a=.97	1466	4.02	1.99	1	7
The Media as a Source of Information-seeking (Media)	a=.98	1470	4.77	1.92	1	7
Intrapersonal Information as a Source of Information-seeking (Internal)	a=.97	1472	4.70	1.88	1	7

Table 8:   Main Study's Construct Reliabilities and Descriptive Statistics

Chapter Six: Analysis & Results

Hypotheses (Figure 5) are examined using the MPlus Structural Equation Modeling Software in order to verify the proposed model relationships. Certain analyses however, need to be conducted prior to the final submission of the data to Mplus. This chapter explains all procedures employed to analyze the data, which are summarized in Figure 6. The results presented here are then discussed in Chapter Seven.
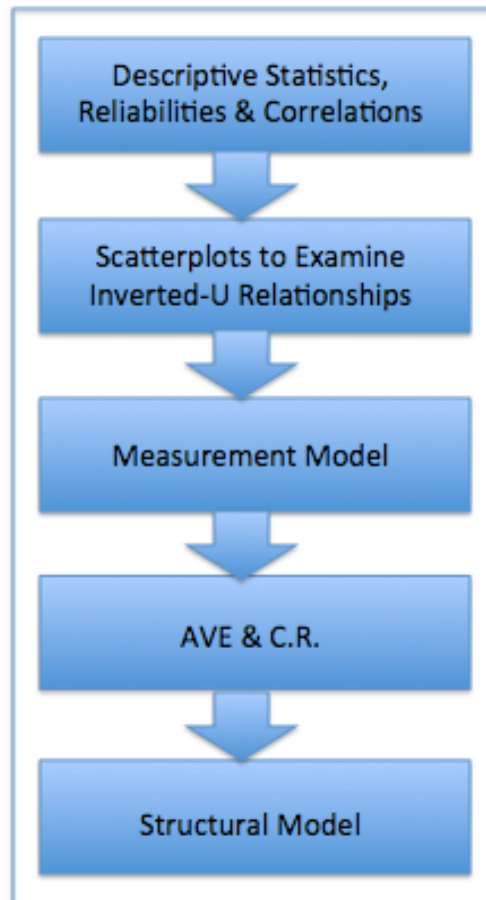
Figure 6:   Summary of Analyses Procedures

6.1. DESCRIPTIVE STATISTICS, RELIABILITIES AND CORRELATIONS

Descriptive statistics for each scale or composite score (as discussed in the previous chapter) were first calculated and are shown in Table 8. The sample was moderately knowledgeable about HPV (M=7.09 out of 15, SD=4.35), but had low experience with HPV (M=1.89 out of 7, SD=1.91) and low personal knowledge (M=2.65 out of 7, SD=1.34). However, the sample had high intentions to engage in prevention behaviors (M=4.7 out of 7, SD=1.69), but participants were moderately likely to engage in information-seeking activities about HPV (M=3.8 out of 7, SD=1.59). The average self-perceived knowledge amount and knowledge use confidence, self-perceptions of the sample, were also moderate (M=3.61 out of 7, SD=1.77 and M=3.73 out of 7, SD=2.00 respectively). Participants also indicated the media to be the preferred source of information-seeking intentions (M=4.77 out of 7, SD=1.92), followed by internal sources/relying on what they already know (M=4.70 out of 7, SD=1.88), friends/family (M=4.33 out of 7, SD=1.94), health professionals (M=4.08 out of 7, SD=1.91), and lastly, the Internet (M=4.02 out of 7, SD=1.99).

Cronbach's alpha's for each scale are shown in Table 8. All the scales were highly reliable, with a Cronbach's alpha above .87, signifying internal construct consistency. Table 9 shows the Bivariate correlations between all scales/composite scores, which were calculated using the Statistical Package for the Social Sciences (SPSS)[1]. All knowledge dimensions (self-perceived knowledge amount, knowledge use

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[1] It is important to note that the correlations computed by SPSS are slightly different from the correlations computed by MPlus. In order to compare all correlations between variables (even the ones that would not be entered in the structural equation modeling), SPSS was used in this instance.

	SPK	KUC	PK	IS	PBI	EK	Test	HP	FF	Web	Media	Internal
SPK	1											
KUC	-.45**	1										
PK	.26**	.08**	1									
IS	.24**	ns	.33**	1								
PBI	.26**	-.15**	.15**	.55**	1							
EK	.46**	-.27**	.16**	.12**	.20**	1						
Test	.59**	-.38**	.09**	.12**	.23**	.56**	1					
HP	-.15**	.14**	-.26**	-.45**	-.25**	-.19**	-.12**	1				
FF	-.20**	.18**	-.24**	-.40**	-.21**	-.19**	-.14**	.73**	1			
Web	-.05*	ns	-.22**	-.46**	-.25**	-.06*	ns	.72**	.67**	1		
Media	-.13**	.10**	-.24**	-.37**	-.12**	ns	ns	.60**	.68**	.67**	1	
Internal	-.33**	-.22**	.12**	ns	ns	.26**	.27**	-.22**	-.29**	-.12**	-.27**	1

Table 9:   Construct Correlations

Notes: ** p< .001
         * p< .05
         ns not significant
SPK (Self-Perceived Knowledge Amount), KUC (Knowledge Use Confidence), PK (Personal Knowledge), IS (Information-seeking Intentions),
PBI (Prevention Behavior Intentions), EK (Experiential Knowledge Score), Test (Actual True Knowledge Score),
HP (Intentions to talk to Health Professionals), FF (Intentions to talk to Friends/Family), Web (Intentions to search the Internet),
Media (Intentions to search the Media), Internal (Intentions to rely on what you already know).

confidence, personal knowledge, knowledge test score and experiential knowledge) were significantly correlated, but not above the common cut off value of .85 (Dijkstra et al., 1998), signifying discriminant validity.

Knowledge test score was positively and significantly correlated with self-perceived knowledge amount (r=.59, p=.00). Experiential knowledge was also positively and significantly correlated with self-perceived knowledge amount (r=.46, p=.00) and knowledge test score (r=.56, p=.00). These correlations are consistent with past findings (see Raju, Lonial & Mangold, 1995; Carlson et al., 2009).

Knowledge test score was negatively and significantly correlated with knowledge use confidence (r=-.38, p=.00), but positively and significantly correlated with personal knowledge (r=.09, p=.00). Self-perceived knowledge amount was positively and significantly correlated with personal knowledge (r=.26, p=.00), but negatively and significantly correlated with knowledge use confidence (r=-.45, p=.00). Knowledge use confidence was negatively and significantly correlated with experiential knowledge (r=-.27, p=.00) and knowledge test score (r=-.38, p=.00), but positively and significantly correlated with personal knowledge (r=.08, p=.00). Personal knowledge was positively and significantly correlated with all other dimensions of knowledge, with the highest correlation being with self-perceived knowledge amount (r=.26, p=.00). And lastly, experiential knowledge was positively and significantly correlated with all other dimensions of knowledge except the knowledge use confidence.

6.2. EXAMINING INVERTED-U RELATIONSHIPS

SPSS derived scatterplots were used to examine the hypothesized inverted-U relationships (H3, H5, & H6), prior to verifying the proposed model relationships with

the MPlus Structural Equation Modeling Software. Mplus does not compute non-linear relationships therefore, if a non-linear relationship (e.g., inverted U relationship) is evident, either the dependent or the independent variable will be squared prior to the structural equation modeling to make the relationship linear, according to Singer and Willett (2003).

Information-seeking intentions and self-perceived knowledge amount were positively and significantly correlated (r=.24, p=.00), as it can be seen in Figure 7, therefore, no changes will be made to these variables. Information-seeking intentions and knowledge use confidence had a non-significant inverted-U relationship (Figure 8). Even though the relationship is non significant based on the correlation between the two variables, their relationship is inverted-U. Therefore, the independent variable in this case will be squared prior to submitting the data to the structural equation modeling for the information-seeking model (dependent variable), in order to ensure linearity of the model.

Structural equation modeling is a more powerful analysis than correlations. Therefore, even though the correlation is not significant here, this result might change based on the use of a latent variable for knowledge use confidence (instead of a composite used here for the correlations). Lastly, prevention behavior intentions had a negative and significant relationship with knowledge use confidence (r=-.15, p=.00), as it is shown in Figure 9, therefore no changes will be made to the knowledge use confidence variable for the prevention behavior model.
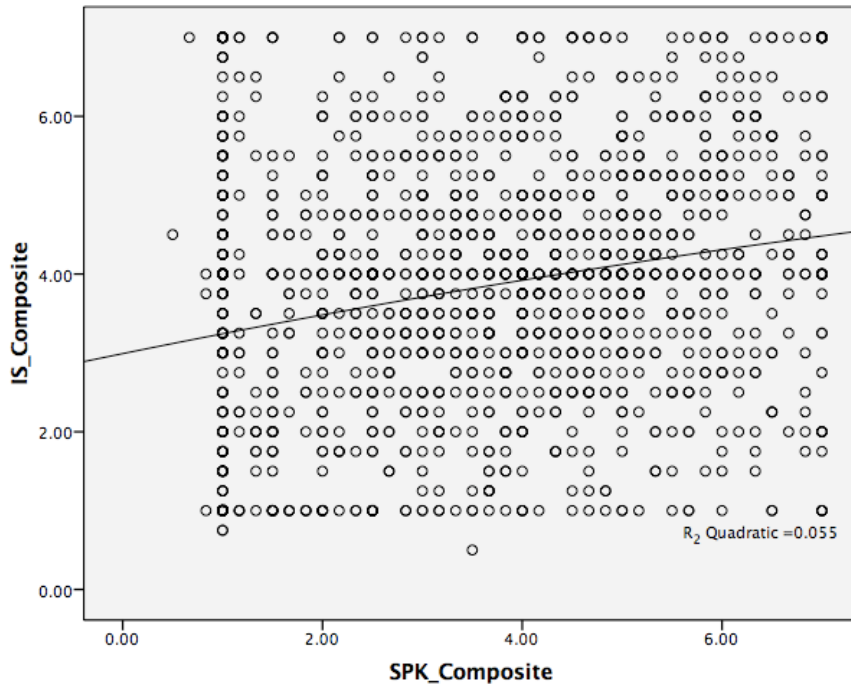
Figure 7:   Information-seeking Intentions and Self-perceived Knowledge Amount
              Scatterplot

6.3. A REVIEW OF THE STRUCTURAL EQUATION MODEL AS AN ANALYTIC METHOD

According to Sauer & Dick (1993) SEM "*provides the ability to model latent variable constructs and to estimate the parameters for both the observed variable - latent variable relationships and the structural relationships simultaneously using the full information contained in the observed variance-covariance matrix*", as opposed to a more restrictive methodology such as a regression (which used composite variables). Mackenzie (2001), also argues that marketing research studies should employ SEM due to its ability to control for measurement error, to test complex theoretical structures, to link micro with macro perspectives, and to assess reliability and validity of the measures.
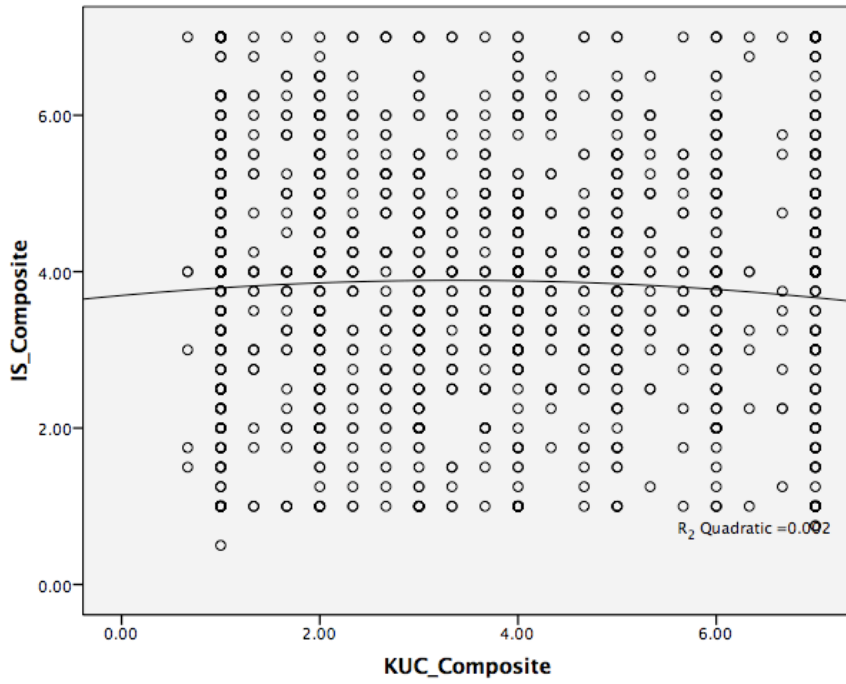
Figure 8: Information-seeking Intentions and Knowledge Use Confidence Scatterplots
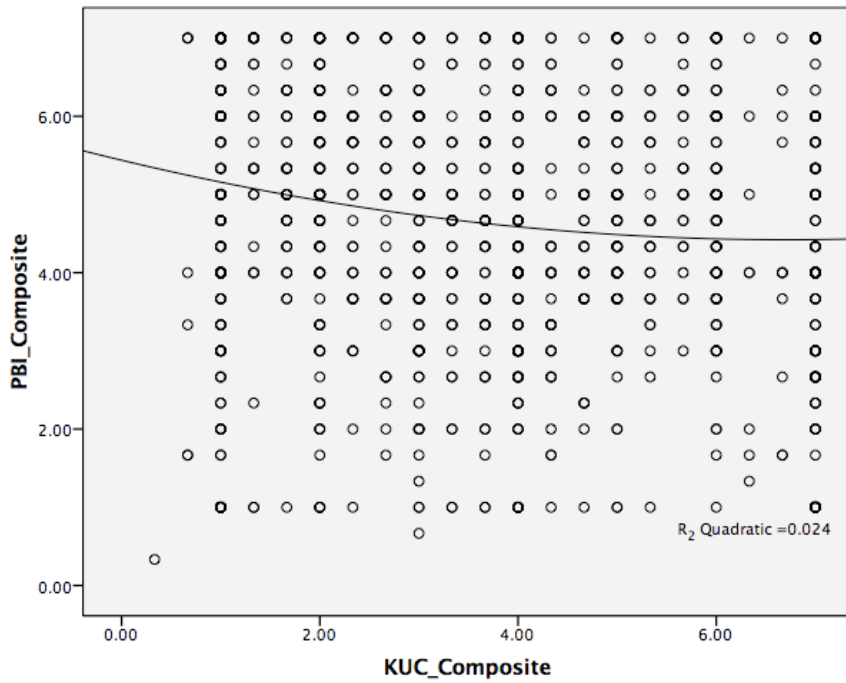
Figure 9: Prevention Behavior Intentions and Knowledge Use Confidence Scatterplot

SEM consists of two parts: the measurement model and the structural model (Kline, 2005). The measurement model depicts the relationship between the latent variable and the individual measures employed. The structural model explains the relationship between the latent variables hypothesized. Fit indices assess how close the data fit with the hypothesized theoretical model. The next two sections of this chapter present the results of the measurement models and the structural equation models.

6.4. MEASUREMENT MODELS

Confirmatory factor analyses were first conducted for each of the independent and dependent variables. Results can be seen in Table 10 and Figure 10. All resulting CFAs (with the additions of WITH statements per Kline 2005 procedure to improve fit of measurement models) showed high and significant loadings, with excellent fit (not all χ^2 were non significant, since this index is sensitive to large samples, but all other fit indices, such as RMSEA, CFI, TLI, SRMR, indicated good fit for all the measurement models indicating that the measures employed actually fit the constructs being measured).

Average variance extracted (AVE) for these constructs were also calculated and met Fornell and Larcker's (1981) thresholds, since each of the constructs had an AVE that was greater than the shared variance of other constructs. As shown in Table 10, all scales had an AVE above the cutoff value of .50 based on Fornell and Larcker's (1981) heuristic for showing unidimensionality, convergent and discriminant validity. Construct reliabilities were also calculated and were above .88, as seen in Table 10 (cut off value .70 according to Fornell and Larcker, 1981). In summary, all scales were shown to be valid and reliable, and the measurement models indicated good fit. Thus, the author was able to move to the next step of the analysis procedure: the structural equation models.

Variables, Measures & Model Indices	CFA Loadings	R²	AVE & C.R.	N
Self-perceived Knowledge Amount				1476
ORIGINAL MEASUREMENT MODEL χ^2=1668.082, df=9, p=.00; RMSEA = .353, 90% C.I.= .33-.36, p=.00; CFI = .837; TLI=.728; SRMR = .066				
FINAL MEASUREMENT MODEL χ^2=2.936, df=3, p=.40; RMSEA = .000, 90% C.I.= .00-.04, p=.98; CFI = 1; TLI=1; SRMR = .004			AVE= .71 C.R. = .93	
In general, how much do you think you know about…				
…HPV.[a] (SPK1)	.724*	.524		
…how to protect yourself from HPV.[a] (SPK2)	.720*	.518		
…the potential health consequences of having HPV.[a] (SPK3)	.734*	.538		
Compared to most people, I am quite knowledgeable about…				
…HPV.[b] (SPK4)	.947*	.897		
…how to protect yourself from HPV.[b] (SPK5)	.924*	.854		
…the potential health consequences of having HPV.[b] (SPK6)	.953*	.908		
SPK3 WITH SPK2	.636*			
SPK5 WITH SPK2	.300*			
SPK2 WITH SPK1	.568*			
SPK3 WITH SPK1	.572*			
SPK6 WITH SPK3	.227*			
SPK4 WITH SPK1	.180*			

Table 10:   Confirmatory Factor Analyses

Variables, Measures & Model Indices	CFA Loadings	R^2	AVE & C.R.	N
Knowledge Use Confidence ORIGINAL/FINAL MEASUREMENT MODEL χ^2=.00, df=0, p=.00; RMSEA = .000, 90% C.I.= .00-.00, p=.00; CFI = 1; TLI=1; SRMR = .000			AVE= .90 C.R. = .96	1476
How confident do you feel about your ability to…	.941*	.886		
…make HPV prevention choices?[c]	.970*	.941		
…use your knowledge of HPV in making prevention choices?[c]	.934*	.873		
…use your knowledge of HPV in making every day activity choices?[c]				

Table 10:   Confirmatory Factor Analyses (continued)

Variables, Measures & Model Indices	CFA Loadings	R^2	AVE & C.R.	N
<u>Personal Knowledge</u>				
ORIGINAL MEASUREMENT MODEL χ^2=205.585, df=9, p=.00; RMSEA = .122, 90% C.I.= .11-.14, p=.00; CFI = .962; TLI=.937; SRMR = .028				1474
FINAL MEASUREMENT MODEL χ^2=.073, df=3, p=.87; RMSEA = .000, 90% C.I.= .00-.023, p=.99; CFI = 1; TLI=1; SRMR = .002			AVE= .63 C.R. = .91	
To what extent do you personally feel you are at risk of being infected with HPV? [d] **(PK1)**	.791*	.626		
How severe a threat is HPV to you personally? [e] **(PK2)**	.791*	.626		
In general, the HPV topic is very relevant to me personally. [e] **(PK3)**	.747*	.559		
Do you actively engage in any behaviors that might put you at risk of getting HPV? [e] **(PK4)**	.748*	.560		
I believe I am personally at risk for getting infected with HPV. [d] **(PK5)**	.942*	.887		
To what extent does the HPV topic apply to your own health care decision-making personally? [e] **(PK6)**	.714*	.509		
PK5 WITH PK3	-.245*			
PK5 WITH PK2	-.758*			
PK6 WITH PK3	.270*			
PK4 WITH PK2	-.204*			
PK3 WITH PK1	.122*			
PK6 WITH PK5	-.165*			

Table 10:   Confirmatory Factor Analyses (continued)

Variables, Measures & Model Indices	CFA Loadings	R^2	AVE & C.R.	N
<u>Information-seeking Intentions</u> ORIGINAL MEASUREMENT MODEL χ^2=30.796, df=2, p=.00; RMSEA = .099, 90% C.I.= .07-.13, p=.00; CFI = .993; TLI=.978; SRMR = .012 FINAL MEASUREMENT MODEL χ^2=.091, df=1, p=.76; RMSEA = .000, 90% C.I.= .00-.047, p=.96; CFI = 1; TLI=1; SRMR = .001			AVE= .70 C.R. = .90	1470
I intend to seek Gardasil related information. [b] **(IS1)**	.830*	.688		
I intend to actively search for information about HPV. [b] **(IS2)**	.916*	.839		
I like having information about HPV. [b] **(IS3)**	.715*	.511		
I intend to actively seek information on how to prevent myself from getting infected with HPV. [b] **(IS4)**	.871*	.759		
IS4 WITH IS3	.201*			

Table 10:   Confirmatory Factor Analyses (continued)

Variables, Measures & Model Indices	CFA Loadings	R^2	AVE & C.R.	N
<u>Prevention Behavior Intentions</u> ORIGINAL/FINAL MEASUREMENT MODEL χ^2=.00, df=0, p=.00; RMSEA = .000, 90% C.I.= .00-.00, p=.00; CFI = 1; TLI=1; SRMR = .000			AVE= .72 C.R. = .88	1471
It is important to me to do everything I reasonably can to avoid getting infected with HPV.[b]	.934*	.873		
I will do all I know to do to prevent myself from getting infected with HPV.[b]	.933*	.933		
I will change my behavior to try to avoid getting infected with HPV.[b]	.653*	.653		

Table 10:   Confirmatory Factor Analyses (continued)

<u>Notes:</u>   ® Reverse Coded,[a] 7-point bipolar adjective scale (1=Nothing, – 7= A Lot), [b] 7-point bipolar adjective scale (1=Strongly Disagree – 7= Strongly Agree),
[c] 7-point bipolar adjective scale (1=Confident – 7= Not Confident), [d] 7-point bipolar adjective scale (1=At no risk – 7= At great risk),
[e] 7-point bipolar adjective scale (1=Not at all – 7= A Lot), [f] 7-point bipolar adjective scale (1=Extremely Likely – 7= Extremely Unlikely),
*p=.000, AVE = Average Variance Extracted, C.R. Construct Reliability.
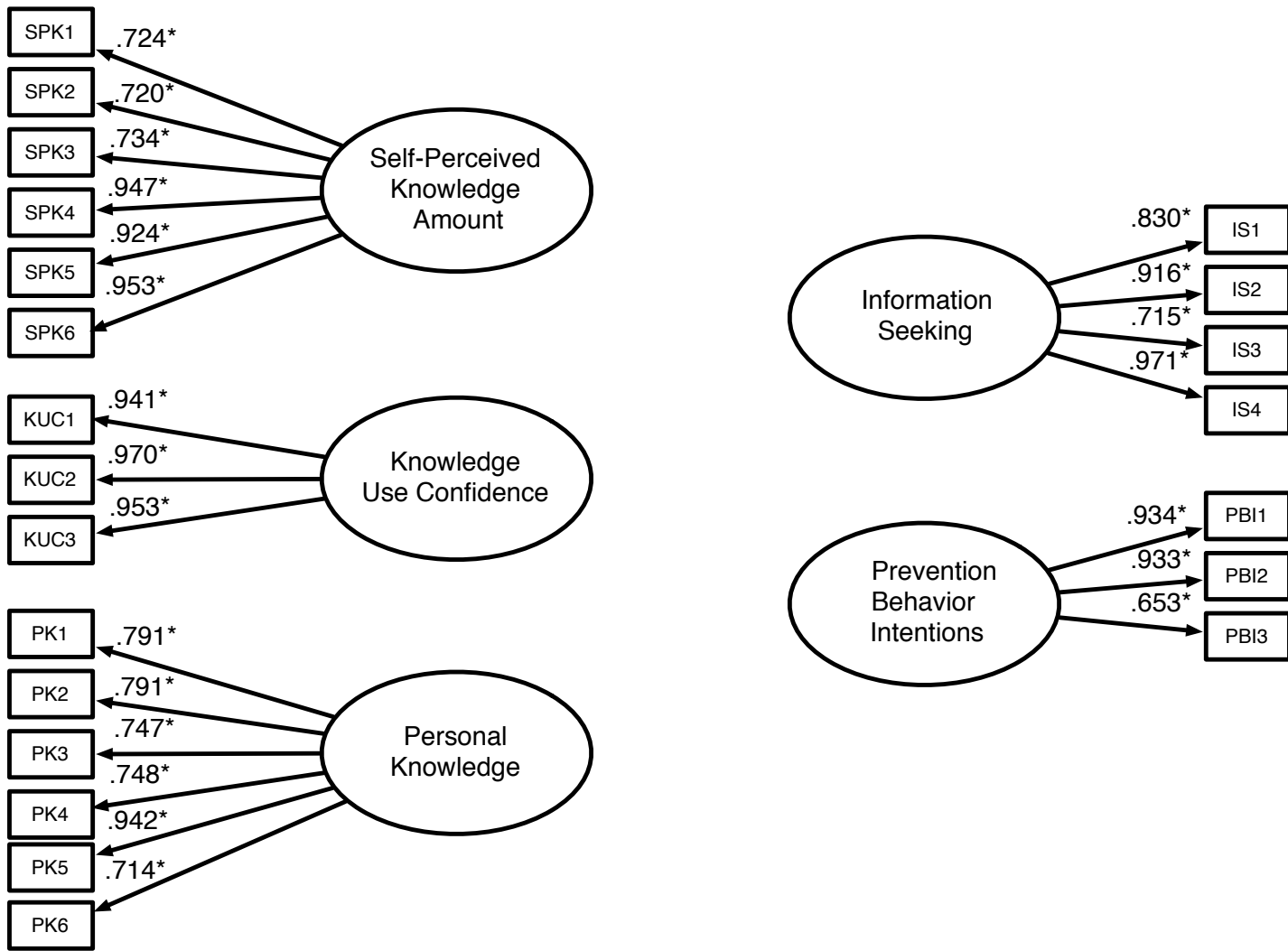
Figure 10:   Confirmatory Factor Analyses Results

6.5. STRUCTURAL EQUATION MODELS

The maximum likelihood procedure was used to estimate the unknown parameters. Based on the measurement models, two structural equation models were computed: one for information-seeking intentions and the other one for prevention behavior intentions. Due to the nature of the structural equation modeling, the hypothesis testing is not sequential, but is organized by dependent variable (research question). Table 11 presents a summary of which hypotheses were and were not supported.

Hypotheses	Supported?	Why not?
H1: There will be significant and positive relationship between knowledge test score results and information-seeking intentions.	No	Not significant relationship
H2: There will be no significant relationship between knowledge test score results and behavioral intentions.	No	Positive & significant relationship
H3: There will be a significant inverted-U relationship between self-perceived knowledge amount and information-seeking intentions.	No	Positive & significant relationship
H4: There will be a significant positive relationship between self-perceived knowledge amount and behavioral intentions.	Yes	
H5: There will be a significant inverted-U relationship between knowledge use confidence and information-seeking intentions.	No	Not significant relationship
H6: There will be a significant inverted-U relationship between knowledge use confidence and behavioral intentions.	No	Not significant relationship

Table 11:   Supported Hypotheses

Hypotheses	Supported?	Why not?
H7: There will be a significant positive relationship between personal knowledge and information-seeking intentions.	Yes	
H8: There will be a significant positive relationship between personal knowledge and behavioral intentions.	No	Not significant relationship
H9: There will be a significant negative relationship between experiential knowledge and information-seeking intentions.	No	Not significant relationship
H10: There will be a significant positive relationship between experiential knowledge and behavioral intentions.	Yes	
H11: There will be a significant positive correlation between knowledge test score and self-perceived knowledge amount.	Yes	
H12: There will be a significant positive correlation between self-perceived knowledge amount and experiential knowledge.	Yes	
H13: There will be a significant positive correlation between information-seeking intentions and behavioral intentions.	Yes	

Table 11:   Supported Hypotheses (continued)

6.5.1. Information-seeking Model (Research Question 1)

Fit indices for the information-seeking intentions model indicated good fit (RMSEA=.057, 90% C.I. = .05-.06, p=.000; CFI=.970; TLI=.962; SRMR=.065). The model accounted for 12.9% of the variance. Results can be seen in Table 12 and Figure 11.

Self-perceived knowledge amount (β=.156, p=.00) and personal knowledge (β=.292, p=00) were significant predictors of information-seeking intentions, as hypothesized. However, self-perceived knowledge amount did not have the hypothesized inverted-U relationship with information-seeking, as discussed earlier (see section 6.2). Therefore, H3 is not supported. Thus, only H7 (personal knowledge and information-seeking will be positively and significantly related) is supported. Knowledge use confidence, experiential knowledge, and knowledge test score were not found to significantly predict information-seeking intentions, therefore, H1, H5, and H9 were also not supported.

Lastly, H11 (knowledge test score and self-perceived knowledge amount will be positively and significantly correlated) and H12 (self-perceived knowledge amount and experiential knowledge will be positively and significantly correlated) were supported. Knowledge test score was positively and significantly correlated with self-perceived knowledge amount (β=.547, p=.00 / also when using composites r=.59, p=.00), and self-perceived knowledge amount was positively and significantly correlated with experiential knowledge (β=.439, p=.00 / also when using composites r=.46, p=.00).

Variables	Standardized Loadings	S.E.	z-scores
Self-Perceived Knowledge Amount→IS	.156**	.035	4.455
Knowledge Use Confidence→IS	.045	.031	1.463
Personal Knowledge→IS	.292**	.027	10.985
Experiential Knowledge→IS	.014	.033	0.416
Knowledge Test→IS	-.003	.035	-0.098
Knowledge Test WITH Self-Perceived Knowledge Amount	.547**	.019	29.055
Self-Perceived Knowledge Amount WITH Experiential Knowledge	.439**	.022	19.982
**p=.000, *p=.05 N=1476 χ^2=947.761, df=163, p=.000 RMSEA=.057, 90% C.I. = .05-.06, p=.000 CFI=.970, TLI=.962 SRMR=.065 R^2=.129			

Table 12:   Information-seeking Intentions: Model Structural Equation Model Results

Notes: IS = Information-seeking Intentions (Dependent Variable)
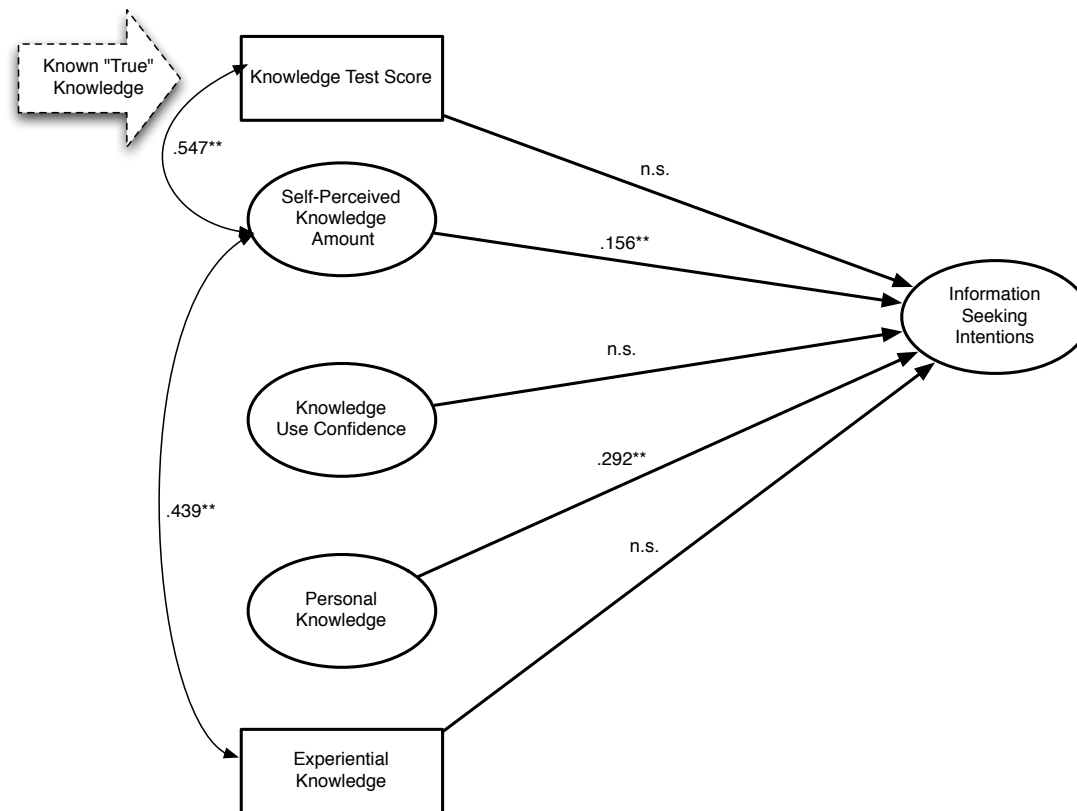
**p=.000, n.s. = not significant

----- Arrow ---- Represents known "true" knowledge, which is used for the calculation of the knowledge test score. No hypotheses are offered and tested for the known "true" knowledge dimension of prior knowledge. It is a construct known from external factual information.

Figure 11:   Information-seeking Intentions: Structural Equation Model Results

6.5.2. Prevention Behavior Model (Research Question 2)

Fit indices for the prevention behavior intentions model indicated good fit (RMSEA=.057, 90% C.I. = .05-.06, p=.002; CFI=.973; TLI=.969; SRMR=.065). The model accounts for 9.2% of the variance. Results can be seen in Table 13 and Figure 12.

Self-perceived knowledge amount (β=.107, p=.00) and experiential knowledge (β=.082, p=.00) are significant predictors of prevention behavior intentions, supporting H4 (significant and positive relationship between self-perceived knowledge amount and prevention behavior intentions), and H10 (significant and positive relationship between experiential knowledge and prevention behavior intentions). Knowledge test score was also a significant predictor of prevention behavior intentions (β=.145, p=.00), thus not supporting H2 (there will be a non significant relationship between knowledge test score and prevention behavior intentions).

Knowledge use confidence, and personal knowledge were not significant predictors of prevention behavior intentions. Therefore, H6 (knowledge use confidence will have a significant inverted-U relationship with prevention behavior intentions) and H H8 (personal knowledge and prevention behavior intentions will be positively and significantly related) were not supported.

Lastly, H11 (knowledge test score and self-perceived knowledge amount will be positively and significantly correlated) and H12 (self-perceived knowledge amount and experiential knowledge will be positively and significantly correlated) were also supported for the prevention behavior intentions model. Knowledge test score was positively and significantly correlated with self-perceived knowledge amount (β=.547, p=.00 / also when using composites r=.59, p=.00), and self-perceived knowledge amount

Variables	Standardized Loadings	S.E.	z-scores
Self-Perceived Knowledge Amount→PBI	.107**	.035	3.039
Knowledge Use Confidence→ PBI	-.040	.031	-1.295
Personal Knowledge→ PBI	.028	.028	1.023
Experiential Knowledge→ PBI	.130**	.030	4.337
Knowledge Test Score	.145**	.035	4.142
Knowledge Test WITH Self-Perceived Knowledge Amount	.547**	.019	29.051
Self-Perceived Knowledge Amount WITH Experiential Knowledge	.436**	.022	20.003
**p=.000, *p=.05 N=1476 χ^2=828.915, df=145, p=.000 RMSEA=.057, 90% C.I. = .05-.06, p=.002 CFI=.973, TLI=.969 SRMR=.065 R^2=.092			

Table 13:   Prevention Behavior Intentions: Model Structural Equation Model Results

Notes: PBI=Prevention Behavior Intentions (Dependent Variable)
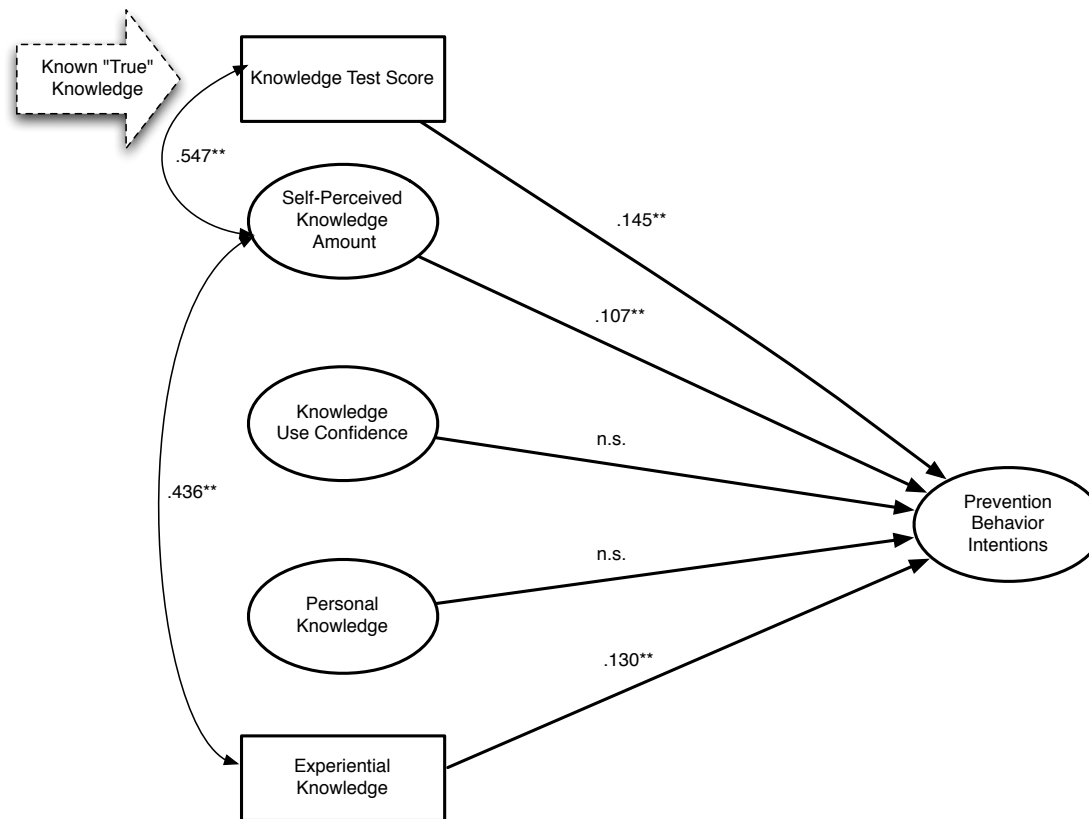
**p=.000, n.s. = not significant

----- Arrow ---- Represents known "true" knowledge, which is used for the calculation of the knowledge test score. No hypotheses are offered and tested for the known "true" knowledge dimension of prior knowledge. It is a construct known from external factual information.

Figure 12:   Prevention Behavior Intentions: Structural Equation Model Results

was positively and significantly correlated with experiential knowledge (β=.436, p=.00 / also when using composites r=.46, p=.00).

As stated earlier, Table 11 shows the original hypotheses and whether or not they were supported, in addition to why some hypotheses were not supported based on the structural equation model results. Lastly, it should be noted that H13 was also supported based on the correlation computed with SPSS. Information-seeking intentions were positively and significantly correlated with prevention behavior intentions (r=.55, p=.00). Therefore, only H4, H7, H10, H11, H12, and H13 were supported by the results[2]. These results, pertaining to RQ1 and RQ2 are discussed in Chapter Seven. The following section presents the results pertaining to consumers' information source preferences, based on their prior knowledge set (RQ3).

6.6. INFORMATION SOURCE PREFERENCES (RESEARCH QUESTION 3)

As seen in Table 7, bivariate correlations were also calculated between sources of information (e.g., health professionals, friends and family, the Internet, the media, and internal sources of information) and the dimensions of prior knowledge (knowledge test score, self-perceived knowledge amount, knowledge use confidence, personal knowledge and experiential knowledge), in order to answer research question 3.

Knowledge test score had a negative and significant relationship with talking to health professional (r=-.12, p=.00), and friends/family (r=-.14, p=.00), as a source of HPV-related information. The relationships between knowledge test score and both the Internet and the media, as sources of information, were not significant. In addition,

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[2] Appendix D shows a post hoc analysis using regressions. The use of composite scales in regressions instead of latent constructs provides different results, regarding the hypothesized relationships.

knowledge test score had a significant and positive relationship (r=.27, p=.00) with internal sources of information (rely on what you already know).

Self-perceived knowledge amount had negative and significant relationships with health professionals (r=-.15, p=.00), friends/family (r=-.20, p=.00), the Internet (r=-.05, p=.05) and the media (r=-.13, p=.00), as sources of information. However, self-perceived knowledge amount had a positive and significant (r=.33, p=.00) relationship with internal sources of information (rely on what you already know).

Knowledge use confidence had a positive and significant relationship with health professionals (r=.14, p=.00), friends/family (r=.18, p=.00), and the media (r=.10, p=.00), as sources of information. The relationship with the Internet as a source of information was not significant, and there was a negative and significant relationship (r=-.22, p=.00) with internal sources (rely on what you already know).

Personal Knowledge had negative and significant relationships with health professionals (r=-.26, p=.00), friends/family (r=-.24, p=.00), the Internet (r=-.22, p=.00), and the media (r=-.24, p=.00), as sources of information. It also had a positive and significant relationship (r=.12, p=.00) with internal sources of information (rely on what you already know).

Lastly, experiential knowledge had a negative and significant relationship with health professionals (r=-.19, p=.00), friends/family (r=-.19, p=.00), and the Internet (r=-.05, p=.05), as sources of information. The relationship with the media was not significant, but experiential knowledge had a positive and significant (r=.26, p=.00) relationship with internal sources of information (rely on what you already know).

It is also important to note that searching for information via health professionals, friends/family, the Internet and the media had a negative and significant correlation with the general measure of information-seeking (IS) employed in this study. Internal sources of information (rely on what you already know) had a non-significant relationship with the general measure of information-seeking (IS) employed in this study.

These results conclude the analyses and results chapter of this dissertation, which are further discussed in Chapter Seven. In summary, self-perceived knowledge amount, and personal knowledge significantly predicted information-seeking intentions; knowledge test score, self-perceived knowledge amount, and experiential knowledge significantly predicted disease prevention behavior intentions; and lastly, knowledge use confidence was most strongly associated with seeking information via external sources of information, compared to other prior knowledge dimensions.

Chapter Seven: Discussion of Results

This chapter discusses the results of analyses reported in the previous chapter. The discussion of results is organized by research question (as did Chapter Six). The following chapter (Chapter Eight) then provides the theoretical, methodological and practical implications of the results, as well as this study's limitations and guidelines for future research.

7.1. RESEARCH QUESTION 1: THE DIFFERENTIAL EFFECTS OF PRIOR KNOWLEDGE DIMENSIONS ON INFORMATION-SEEKING INTENTIONS

Based on the results of this research, the information-seeking model had good fit, meaning that the model tested predicts information-seeking intentions well. The findings show that information-seeking intentions are predicted by an individual's self-perceived knowledge amount and his/her personal knowledge. Explanations of the results for information-seeking are offered below and organized by dimension of prior knowledge, followed by the hypothesized correlations.

7.1.1. Self-perceived Knowledge Amount (& Knowledge Use Confidence)

Self-perceived knowledge amount had a positive and significant relationship with information-seeking, meaning that the higher an individual's self-perceived knowledge amount the higher the likelihood of seeking information. This implies that the more an individual thinks he/she knows, the more likely he/she will engage in information-seeking activities. Prior research has also suggested that there is a strong link between self-perceived knowledge amount and information-seeking (cf., Brucks, 1985; Raju, Lonial, and Mangold, 1995; Moorman et al., 2004). However, prior research findings

support an inverted-U and significant relationship between self-perceived knowledge amount and information-seeking (Brucks, 1985; Raju, Lonial, and Mangold, 1995).

This difference between the current study's results and those from prior literature might be due to the more refined measurement of knowledge use confidence used here. The current study used separate measured for self-perceived knowledge amount and knowledge use confidence (instead of a combined measurement as per Moorman et al., 2004 – also discussed in Chapter Two).

While it might appear that this finding is inconsistent with prior literature, however, the current study contains a methodological refinement, in that self-perceived knowledge amount and knowledge use confidence are measured as distinct constructs. Given this methodological refinement used in the present study, the findings in terms of self-perceived knowledge amount (as it is measured separately from knowledge use confidence) should not be directly compared with previous research. The same applies for the results found here between knowledge use confidence and information-seeking (as knowledge use confidence is measured separately from self-perceived knowledge amount).

Another explanation for the positive and significant relationship between self-perceived knowledge amount and information-seeking might be due to the use of a health-related topic, in lieu of a product situation. HPV is a health-related topic that recently became popular with the introduction of the HPV vaccine, in contrast to the use in prior research of a product or the use of another health-related topic that consumers might be more knowledgeable about (e.g., allergies). Consumers do not know very much about HPV, as is indicated by this sample's knowledge test score (M=7.05 out of 15).

However, HPV was recently in the spotlight, due to aggressive DTC campaigns for Gardasil, as well as the constant media exposure regarding this scientific breakthrough. Therefore, it is logical that consumers might think they know more than they actually do.

Despite the sample's high self-perceived knowledge amount, because HPV still remains a hot topic for discussion (as indicated by its reference in the media), consumers might be more likely to seek information about HPV, in order to feel that they still remain knowledgeable about this topic (even though they weren't knowledgeable in the first place). Knowledge begets knowledge (Golden and Stanaland, 2000).

7.1.2. Personal Knowledge

Another clear result in the present study is a significant and positive relationship between personal knowledge and information-seeking, implying that the larger the subset of one's knowledge an individual uses, the greater the likelihood that one will indicate information-seeking intentions. This finding is consistent with the hypothesized relationship. The current study is also the first study to measure personal knowledge and examine its effects on information-seeking. It is evident that personal knowledge is an important element that affects consumer's information-seeking activities, and should be addressed in the future.

7.1.3. Knowledge Test Score

In the present study, knowledge test score was not significantly related with information-seeking, indicating that what matters more, is what an individual thinks he/she knows (measured by self-perceived knowledge amount), as opposed to what an individual really knows (measured by knowledge test score). This finding comes in

contrast with prior literature findings, which suggest a significant relationship between knowledge test score and information search (Brucks, 1985; Moorman et al., 2004).

As this research and then previous studies have suggested, there is a difference between raising awareness about a health-topic, which would result in increasing an individual's knowledge test score, and motivating consumers to act, which would require something more than high knowledge test scores. Based on this logic, consumers with high knowledge test score, who are highly aware of the disease (e.g., HPV) wouldn't necessarily be motivated to seek information about how to prevent the disease (e.g., maybe because they think this disease does not apply to them – which is where the importance of personal knowledge comes in).

Therefore, the non-significant result found here between knowledge test score and information-seeking might be due to the impact of other, more important, dimensions of prior knowledge for information-seeking intentions that were also tested (e.g., the effect of what part of one's knowledge, one will apply on decision-making situations: personal knowledge). Also, the nature of the case employed (i.e., health related and the complexity of HPV, specifically) may be contributing to this insignificant result between knowledge test score and information-seeking.

7.1.4. Knowledge Use Confidence

Prior literature has also suggested that Bandura's concept of self-efficacy might be a motivator for consumers to take the suggested health-related action featured in the DTC or public health message. The present study employed a similar concept – knowledge use confidence – however it was not a significant predictor of information-seeking. There is a difference between one's confidence in using one's knowledge

(knowledge use confidence) and one's confidence is taking the recommended action (Bandura's self-efficacy construct). This may explain why knowledge use confidence did not act as a motivator for information-seeking in this case. In addition, as discussed under section 7.1.1, the present study measured knowledge use confidence as a separate construct from self-perceived knowledge amount, compared to prior literature that used a combined measure of self-perceived knowledge amount and knowledge use confidence.

7.1.5. Experiential Knowledge

Experiential knowledge was also found to have a non-significant relationship with information-seeking. This result is inconsistent with prior literature, which found that the more experience one has, the less likely he/she will seek additional information (cf., Raju, Lonial, and Mangold, 1995). Prior research has measured experiential knowledge based on whether an individual has used, owned, or searched for information about a product, which slightly resembles the measurement used here to measure experience with HPV. However, prior literature focused on product situations, rather than health issues such as HPV, which might explain these inconsistent results.

The measure employed in this research for experience with HPV (experiential knowledge) was based on whether or not participants had been diagnosed with HPV/vaccinated against, or knew someone who has been diagnosed with HPV/vaccinated against HPV, or had seen a Gardasil ad. Even though this scale measures an individual's experience with HPV, it focuses more on exposure to HPV information, as opposed to true knowledge about HPV. For example, while someone may have HPV, this does not necessarily mean that he/she knows the facts about HPV.

In addition, as noted in the methodology chapter, the nature of how scores were calculated (summation of items for experiential knowledge) assumes equal weight of each item, which may explain this result. For example, someone who had HPV at some point should be more experienced than someone who knows of one who had HPV. However, the way the present study calculated experiential knowledge scores, it assumes that someone who had HPV has the same amount of knowledge with someone who knows one that had HPV. Therefore, the way the experiential knowledge score was measured might be causing this inconsistent with prior literature result between experiential knowledge and information-seeking.

However (as discussed earlier for knowledge test score), an individual who has a lot of experience with a disease (increased awareness of HPV and its implications) wouldn't necessarily be motivated to seek information about how to prevent himself/herself if he/she did not think that this disease is personally relevant to his/her (e.g., high personal knowledge). Therefore, when taking into account all six dimensions of prior knowledge (instead of just examining the impact of experiential knowledge on information-seeking), other more important dimensions of prior knowledge (e.g., personal knowledge) might be creating this insignificant effect of experiential knowledge on information-seeking. Given that the present study found personal knowledge to be a powerful motivator for information-seeking intentions, it might explain why experiential knowledge might not affect information-seeking, after personal knowledge is taken into account.

7.1.6. Correlations

The information-seeking model also showed positive and significant correlations between self-perceived knowledge amount and knowledge test score, as well as self-perceived knowledge amount and experiential knowledge. That means that the higher an individual's knowledge test score, the more he/she thinks he/she knows, and the more experience someone has the more he/she thinks he/she knows. These findings are consistent with prior literature (c.f., Raju, Lonial, and Mangold, 1995).

It is also important to highlight that even though knowledge test score and experiential knowledge were not significant predictors of information-seeking intentions, they are indirectly affecting information-seeking, via the self-perceived knowledge amount dimension of prior knowledge (which had a significant direct impact on information-seeking). These correlations provide proof that when all dimensions of prior knowledge are taken into account, some of them (e.g., experiential knowledge) might loose significance, given the stronger association with information seeking of other dimensions of prior knowledge (e.g., personal knowledge). The correlation results imply that even though knowledge test score and experiential knowledge do not directly impact information-seeking, they are still important dimensions of prior knowledge (indirectly affecting) for information-seeking .

In conclusion, the likelihood of an individual engaging in information-seeking activities is predicted by how much an individual thinks he/she knows (self-perceived knowledge amount) and how much of his/her knowledge he/she applies in decision-making situations (personal knowledge). However, the indirect effect of knowledge test score and experiential knowledge (due to their significant correlations with self-perceived

knowledge amount) should also be accounted for. This implies that the higher an individual's self-perceived knowledge amount, personal knowledge, knowledge test score and experiential knowledge, the higher the individual's information-seeking intentions will be.

7.2. RESEARCH QUESTION 2: THE DIFFERENTIAL EFFECTS OF PRIOR KNOWLEDGE DIMENSIONS ON PREVENTION BEHAVIOR INTENTIONS

Based on the results of the current study, the prevention behavior model also had good fit, meaning that this model predicts disease prevention behaviors well. The findings suggest that prevention behavior intentions are predicted by knowledge test score, self-perceived knowledge amount and experiential knowledge. More specifically, the higher an individual's knowledge test score, self-perceived knowledge amount and experience, the higher the likelihood in engaging in preventative actions.

This is the first known study to examine the effects of prior knowledge dimensions on preventive behaviors. Explanations of the results for prevention behaviors are offered below and organized by dimension of prior knowledge. Lastly, this section explains the resultant relationship between the two dependent variables: information-seeking (RQ1) and prevention behaviors (RQ2).

7.2.1. Self-perceived Knowledge Amount

As hypothesized, self-perceived knowledge amount had a positive and significant relationship with prevention behavior intentions. Witte's (1992) Extended Parallel Processing Model states that consumers are either motivated for danger control or fear control. Those consumers who would be motivated for danger control would be more likely to take the recommended preventative action, as opposed to those who are

motivated for fear control, thus more likely to ignore the threat of a disease as a way to control their fear. Consumers who have high self-perceived knowledge amount, might be more likely to take preventative actions, because they are more likely to be motivated for danger control. That's because they think they know how to protect themselves from the disease (even if they do not in reality), instead of fearing the disease itself. Therefore, consumers with high self-perceived knowledge amount are more likely to be motivated for danger control and thus more likely to take the recommended action (based on the EPPM).

7.2.2. Experiential Knowledge

In addition consumers with more experience with a disease might be more likely to take prevention measures, since they are more likely to understand the importance of preventing HPV or because they know someone who has or had HPV, which would increase their perceived level of personal risk of contracting the disease (e.g., "it happened to my friend it can happen to me"). Another explanation for this result, might be that consumers with more experience with a disease might think they know more than they actually do (high self-perceived knowledge amount), which would motivate them for danger control as discussed previously. This notion is also supported by the positive and significant correlation between self-perceived knowledge amount and experiential knowledge.

7.2.3. Knowledge Test Score

It was hypothesized that knowledge test score would have no impact on prevention behavior, since there is a difference between knowing something and actually being motivated to take action. Contradicting this notion, the findings of this research

suggest that the higher the knowledge test score the more likely the individual will take preventive actions. The individual's perceived risk of the disease (related to EPPM) might be responsible for this effect. Consumers who know a lot about the consequences of HPV, for example, (high knowledge test score), might understand the importance of preventing HPV. Therefore, consumers with high knowledge test scores are more likely to get vaccinated against HPV, as opposed to consumers who have low knowledge test scores (which might motivate them for fear control).

7.2.4. Knowledge Use Confidence

Knowledge use confidence was not significantly related to prevention behavior intentions. A reason behind this result might be due to its distinct measurement (separated from self-perceived knowledge amount), or due to the difference between Bandura's self-efficacy construct and knowledge use confidence, as discussed previously (section 7.1.) in this chapter.

7.2.5. Personal Knowledge

Interestingly, personal knowledge also had a non-significant relationship with prevention behavior intentions. Due to the sensitive nature of the HPV vaccine, consumers might not want to think that HPV is relevant to them personally or that they are at risk of getting infected with HPV, when considering to take preventative actions. Therefore, consumers would prefer to neglect their personal knowledge level. This is consistent with Witte's EPPM theory that states consumers might be motivated for fear control, and instead of taking preventative actions to prevent the disease, they would more likely control their fear by assuming the disease in not relevant to them personally. Thus, consumers would not apply their knowledge on health related decision-making

situations, if they were motivated to control their fear (instead of controlling the danger of the disease).

In summary, the likelihood of an individual taking preventative actions is predicted by how much an individual really knows (knowledge test score), thinks he/she knows (self-perceived knowledge amount), and the level of experience he/she has with the disease (experiential knowledge).

7.2.6. Correlation between the Dependent Variables

In addition, the correlation between the two dependent variables, information-seeking (RQ1) and prevention behaviors (RQ2) was also examined. Information-seeking and prevention behavior intentions were positively and significantly correlated ($r=.55$, $p=.00$), which means that the higher the information-seeking behaviors, the higher the likelihood of engaging in preventative actions. However, as was discussed in the literature review, prior research usually treats information-seeking as a prevention behavior activity. From the results of this study, it can be inferred that future research should distinguish the two since these behaviors are predicted by different prior knowledge dimensions. Information-seeking is predicted by self-perceived knowledge amount and personal knowledge; and prevention behavior is predicted by knowledge test score, self-perceived knowledge amount and experiential knowledge.

7.3. RESEARCH QUESTION 3: PREFERRED SOURCES OF INFORMATION BASED ON PRIOR KNOWLEDGE DIMENSIONS.

The present study also looked at the preferred sources of information based on consumers' prior knowledge set. Consumers with high knowledge test score, high self-perceived knowledge amount, high personal knowledge and high experiential knowledge

are more likely to rely on what they already know (internal sources of information), than to seek information via any other external source (e.g., health professionals, family/friends, the media, the Internet). Consumers who know a lot about a disease (high knowledge test score), think they know a lot (high self-perceived knowledge amount), apply their knowledge on decision-making situations (high personal knowledge) and have a lot of experience with a disease (high experiential knowledge), would be less likely to look for information using external sources, because they think they do not need the additional external information (since they know/think they know a lot about the disease).

However, there is a fine line between thinking one is knowledgeable and knowing what is necessary. Thus, it is important to note, as evident by the results of the information-seeking structural equation modeling (research question 1 from section 7.1. of this chapter), that consumers with higher personal knowledge and self-perceived knowledge amount are more likely to engage in information-seeking activities, even if it means to use internal sources of information. The dependent variable of the present's study information-seeking model did not specifically measure information-seeking with specific sources of information, but employed a more general measure of information-seeking.

Following the preference for internal sources of information: 1) consumers with high knowledge test score, prefer to seek information via health professionals, followed by information from their family and friends; 2) consumers with high self-perceived knowledge amount prefer health professionals as information sources, followed by friends/family, the Internet, and lastly the media; 3) consumers with high personal knowledge prefer the Internet, followed by friends/family and media, and lastly by health

professionals; and 4) consumers with high experiential knowledge prefer the Internet followed by family/friends and health professionals. These external source preferences are also important to be aware of, in designing health communication and DTCA campaigns. Being able to direct one's information-seeking activities to an information source that is consistent with one's prior knowledge, is more likely to lead to prevention behaviors.

Only consumers with high knowledge use confidence were more likely to use external (vs internal) sources of information. Most specifically, consumers with high confidence in using their knowledge had a preference for family and friends, followed by health professionals, and then the media. This result might be due to the fact that consumers, who have confidence in using their knowledge, feel more capable at validating their knowledge with external sources of information; indicating the importance of knowledge use confidence for external information-seeking activities.

It is also important to note that searching for information via health professionals, friends/family, the Internet and the media had a negative and significant correlation with the general measure of information-seeking (IS) employed in this study. This implies that consumers are motivated to seek information via one information source at a time, instead of using multiple sources of information. Therefore, health communicators should direct consumers' information-seeking activities to an (one) information source based on consumers' prior knowledge set (instead of providing many alternatives).

Chapter Eight: Implications, Limitations & Future Research

This research proposed six dimensions of prior knowledge drawing upon the consumer behavior and the economic psychology literatures, and specifically examined these dimensions in terms of their differential effects on information-seeking intentions (RQ1) and disease prevention behavior intentions (RQ2). In addition, the preferred sources of information were also examined based on an individual's prior knowledge set (RQ3). This study's findings have theoretical, methodological and practical implications, which are discussed in this chapter. Limitations and guidelines for future research are also provided.

8.1. THEORETICAL IMPLICATIONS

From a theoretical perspective the present study extends the prior knowledge literature by advancing six prior knowledge dimensions, based on the combination of the consumer behavior and economic psychology prior knowledge literatures. The six dimensions of knowledge address: 1) a vacuum in consumer behavior prior knowledge literature regarding how much of one's knowledge one applies in decision-making situations (personal knowledge), and 2) definitional and operational inconsistencies of prior knowledge dimensions in the consumer behavior field.

The six prior knowledge dimensions are also examined in terms of their impact on health information-seeking and prevention behaviors. This is the first study to look at the effects of prior knowledge on prevention behaviors, as well as one of the few consumer behavior studies to look at prior knowledge within a health-related context (other than nutrition). Lastly, the present study is unique in its attempt to fill the gap, regarding the

most effective strategies for reaching younger healthcare consumers, in an effort to improve the effectiveness of DTC campaigns targeting them (since prior DTC studies have mostly focused on "older" adults), in addition to examing a crucial health issue for younger consumers (i.e., HPV).

8.2. METHODOLOGICAL IMPLICATIONS

Methodologically, the present study suggests measurements for six prior knowledge dimensions, in an effort to reduce operational inconsistencies within the consumer behavior prior knowledge literature. All measurements created and used in the present study were reliable and valid, therefore, can be used for future prior knowledge research. This is also the first study to measure personal knowledge, which is a unique and vital contribution to the economic psychology literature. The HPV knowledge test questionnaire is also a significant contribution by itself, as it is the first questionnaire designed to gauge the HPV knowledge of both men and women (which was also verified by a health professional).

8.3. PRACTICAL IMPLICATIONS

From a pragmatic perspective the present study also provides recommendations, on what, how, and when, health information should be provided in order to design and implement effective DTC advertising campaigns, based on consumers' prior knowledge set. More specifically, these recommendations can help health communicators motivate information-seeking behaviors and disease prevention behaviors.

First of all, based on the findings of the present study, DTC advertising messages that motivate information-seeking behaviors require different prior knowledge considerations than the DTC messages that motivate prevention behaviors (since these

goals are affected by different prior knowledge dimensions). Therefore, health communicators should treat information-seeking and prevention behaviors as two separate goals of DTC campaigns (since information-seeking activities are affected by different prior knowledge dimensions than prevention behavior activities).

Results suggest that what really matters for information-seeking behaviors, is what an individual thinks he/she knows (measured by self-perceived knowledge amount), as opposed to what the individual really knows (measured by knowledge test score). For example in the case of HPV, prior research (c.f., Manika, Ball, & Stout, 2011) suggests that many young women think they do not need to get vaccinated against HPV if they have never been sexually active. This perceived belief is false, and the "truth" is that the HPV vaccine works best for individuals who have not yet been sexually active. This is an example of what people think they know matters more, that what the actual "truth" is, for information-seeking behaviors.

Health communicators should conduct research that shows light on what consumers think they know and their perceptions of what the "truth" is, in order to be able to create DTC and public health messages that fight false perceptions of reality, and persuade consumers to seek additional information. The DTC and public health messages should then be designed based on consumers self-perceived knowledge amount. This implies that it may be useful to emphasize to consumers that they already have some knowledge so as to appeal to their need for self-validation. Consumers who think they are knowledgeable about a disease (even if they were not knowledgeable in the first place), wish to remain knowledgeable, therefore they would be more likely to engage in information-seeking activities to maintain that knowledge.

However, health communicators should also be cautious of increasing consumers' self-perceived knowledge amount, since if an individual thinks he/she knows the necessary information, he/she will be more likely to rely on what he/she already knows (internal sources of information), instead of using external sources of information. In addition, based on the present study's results, health communicators should know that consumers with high knowledge test score, self-perceived knowledge amount, personal knowledge and experiential knowledge would be more likely to use internal sources of information, as opposed to consumers with high knowledge use confidence who are less likely to use internal sources of information.

This implies that health communicators should design messages that increase consumers' confidence in using their knowledge if they want to motivate consumers to seek information via external sources. Consumers with high confidence in using their knowledge are also more likely to seek information via family and friends about HPV, rather than going to a physician, or searching the media for more information. This is why health communicators should find ways to increase conversation among friends and family about diseases and health-related topics in general. This can be seen as an opportunity for advertisers, marketers and health communicators to create an online tool that can assist people in sharing relevant information about health-related behaviors, such as getting vaccinated with Gardasil. Individuals who make the decision to take a preventive health action might want to share that information with others for social support reasons, in addition to the fact the perception of knowledge begets knowledge. Health communicators can use online tools to make this easier to do so, in order to increase consumers' knowledge use confidence.

Further, increasing consumers' personal knowledge levels (how much of their knowledge they apply in decision-making situations) would also increase the likelihood of engaging in information-seeking activities. When consumers make decisions they only apply a subset of their knowledge on decision-making situations, even for information-seeking decisions. The reasons behind this action are many and very complex, which is why health communicators cannot really predict how much of their knowledge consumers will use when deciding whether or not to take the recommended action by the DTC or public health message. Future research needs to understand how personal knowledge can be predicted and to understand the impact of this dimension of prior knowledge on a deeper level. Based on the present study's findings, personal knowledge is of importance to information-seeking behaviors.

Knowledge test score and experiential knowledge indirectly affect information-seeking behaviors, via the self-perceived knowledge amount dimension. Thus, addressing the accuracy of the health-related information within the DTC messages is an important and vital step in the health communication process. Extended research should be conducted regarding the accuracy of the information to be included in the DTC message (verified by health professionals), before an advertising campaign is designed. Health communicators should also take into account consumers' level of experience, when selecting a target group for the DTC campaign. Information presented in the DTC message should correspond with the target audience's level of experience, in order for the message to be effective in motivating information-seeking behaviors.

In addition, the present study's results show that the higher an individual's knowledge test score, self-perceived knowledge amount and experiential knowledge, the

greater the likelihood of engaging in prevention behaviors. Therefore, health communicators should try to increase consumers' knowledge of the disease, how much they think they know about the disease, and their level of experience with the disease.

These goals can be achieved through repetition of the health-related message, via external sources of information, so as to increase consumers' knowledge test score, self-perceived knowledge amount, and experience with the disease. Taking into account that friends and relatives are the most preferred source of information, based on the high knowledge use confidence consumers, health communicators should also encourage conversation among friends and family, in order to persuade consumers to take the recommended preventative actions.

8.4. LIMITATIONS AND FUTURE RESEARCH

It is evident from the discussion of the present study' results that each of the six dimensions of prior knowledge examined here is important for understanding behavior. Even though the present study makes valuable contributions to the literature in regards to the prior knowledge construct, its results should be inferred and generalized with caution.

First of all, researchers should validate the effects of the six prior knowledge dimensions on behavior, with other topics/cases, both health-related and product situations. Due to the nature of the case employed (i.e., HPV vaccine), only one fourth of the participants had been vaccinated against HPV. This resulted in a low experiential knowledge score for the sample. The newness of the HPV vaccine might have also resulted in the low experiential score of the sample. Therefore, a different less complex health-related case (e.g., allergies, which is less complex that HPV and consumers might know more about it) needs to be employed in the future to validate the findings of the

present study. In addition, examining the six dimensions of prior knowledge on behavior for a product situation would show light on the differences between tangible (product situations) and intangible (health-related) situations, in terms of the relationship between the six dimensions of prior knowledge and behavior.

A methodological limitation of the present study is the measurement of experiential knowledge employed, which assumed equal weights for all items measured (as discussed in an earlier section of this chapter). Future researchers should create and test a measurement of experiential knowledge that allows experiences' weights' to vary based on how much knowledge is acquired from each experience.

Further, important health behavior constructs (e.g., self-efficacy, perceived risk, etc.) from established health-related frameworks (e.g., HBM, EPPM, etc.), were not examined in the present study, which can be seen as a limitation, since one of the goals of the present study was to create effective DTC advertising messages that motivate information-seeking and prevention behaviors. Future research should test previously validated health-related theories, such as Witte's (1992) Extended Parallel Processing Theory and Prochanska's et al. (1998) Health Belief Model, with the addition of the six dimensions of prior knowledge, in order to examine whether or not these frameworks predict the likelihood of taking a recommended health-related action better than before the incorporation of the six prior knowledge dimensions. Both the HBM and EPPM do include some component of prior knowledge in their conceptualizations, but prior studies have rarely measured it, in addition, to only referring to one dimension of prior knowledge: knowledge test score.

Personal knowledge was found to be a significant predictor of information-seeking intentions. However, it is difficult to understand how heath communicators can increase consumers' personal knowledge. Future researchers should conduct focus groups, so as to understand how to increase consumers' personal knowledge. As noted earlier, an individual's perceived level of fear is a key component of many popular health-related models (i.e., EPPM). Looking at how fear can moderate the effects of personal knowledge on information-seeking should also be examined, since fear can motivate individuals to apply a greater extent of their knowledge on decision-making situations (if individuals are motivated for danger control, according to the EPPM).

Interestingly, personal knowledge had no significant relationship with prevention behavior intentions. This is a surprising result that needs to be investigated further, in order to uncover the reasons behind it. It can be speculated that consumers do not wish to think that HPV or another serious health issue is of any relevance to them. Therefore, consumers would be motivated to neglect their personal knowledge level in order to control their fear (consistent with the EPPM).

Also, if a consumer does not think he/she has the ability to take the prevention measure suggested, he/she will not engage in prevention behaviors no matter how much of his/her knowledge an individual uses in decision-making situations (personal knowledge). This is why the mediating effect of Bandura's self-efficacy construct must be investigated in order to uncover whether or not it accounts for the effects between personal knowledge and prevention behavior.

In summary, the results of this dissertation indicate that the likelihood of an individual engaging in information-seeking activities is predicted by how much an

individual thinks he/she knows (self-perceived knowledge amount) and how much of his/her knowledge he/she applies in decision-making situations (personal knowledge). However, the indirect effect of knowledge test score and experiential knowledge (due to their significant correlations with self-perceived knowledge amount) should also be taken into account when designing DTC and public health messages. In addition, the likelihood of an individual taking preventative actions is predicted by how much an individual really knows (knowledge test score), thinks he/she knows (self-perceived knowledge amount), and the level of experience he/she has with the disease (experiential knowledge). Lastly, consumers with high knowledge use confidence are more likely to use external sources of information (instead of internal sources of information).

In conclusion, this study has extended the literature on the prior knowledge construct on multiple levels and provides interesting findings that show many different directions for future research. As Sir Francis Bacon said "knowledge is power", because what we know shapes our lives and what we do not know makes us incapable of making a decision (Keeley, 2007).

Appendix A: Pretest Questionnaire

Cover Letter for Internet Research
Email Message (to be sent to randomly selected panelists)

SUBJECT: **You've been chosen for a survey!**

You are invited to participate in a survey, entitled "Dimensions of Prior Knowledge: Implications for Information Seeking and Prevention Behaviors". The study is being conducted by Danae Manika, Ph.D. Candidate, and Patricia A. Stout, Ph.D. from the Department of Advertising of The University of Texas at Austin [Department of Advertising, A1200, The University of Texas at Austin, 1 University Station, Austin, TX 78712; Tel: (512) 590 4488 or (512) 471 8152 or].

The purpose of this study is to examine your HPV knowledge and perceptions of HPV knowledge, as well as your HPV information seeking and HPV prevention behaviors. Your participation in the survey will contribute to a better understanding of knowledge and its impact on behaviors. We estimate that it will take about **15-20 minutes** of your time to complete the questionnaire. You are free to contact the investigator at the above address and phone number to discuss the survey.

Risks to participants are considered minimal. There will be no costs for participating. There is also no direct benefit o you for participating in this study. Identification numbers associated with email addresses will be kept during the data collection phase for tracking purposes only, in order for you to receive compensation from the Authentic Response panel. Only Authentic Response contractors will have access to your personal information. This information will be stripped from the final dataset given to the investigators by the Authentic Response panel.

Your participation in this survey is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time without penalty. If you wish to withdraw from the study or have any questions, contact the investigator listed above.

If you have any questions or would like to update your email address, please call or send an email to Authentic Response. If you do not want to receive any more reminders, you may email Authentic Response.

To complete the survey, click on the link below:

This study has been reviewed and approved by The University of Texas at Austin Institutional Review Board. If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact -

anonymously, if you wish - the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu.

IRB Approval Number: **2011-02-0110**

If you agree to participate please press the arrow button at the bottom right of the screen otherwise use the X at the upper right corner to close this window and disconnect.

Thank you.

Patricia Stout, Ph.D.
Danae Manika, Ph.D. Candidate
Department of Advertising
The University of Texas at Austin

Entrance Page Message for Survey

Welcome!

Thank you for your interest in this research project!

HPV (Human papillomavirous) is an important health-related issue, in the U.S. As a result, the need to understand more about consumer's understanding of this topic is imperative. We would like your help in answering some questions that will contribute to a better understanding of what consumers know about the topic of HPV, their perceptions and intentions. This questionnaire will take no more than 15-20 minutes to complete.

The first ten sections of the questionnaire will try to gauge your HPV knowledge and perceptions of your knowledge. Then there will be three sections that will ask you to indicate your information seeking and behavioral intentions, followed by the last section, which includes some standard demographics questions.

Rest assured that you will not be asked to identify yourself individually within the survey and any information you provide will remain strictly confidential. You may discontinue or refuse to take part at anytime and your responses will not be processed unless you submit the survey upon completion. By completing the survey you are indicating your voluntary consent to participate in this research.

Please carefully read the instructions at the beginning of each section. Most of the questions can be answered by clicking on the button(s) that best expresses your answer.

Questions about the study should be directed to Danae Manika at 512-590-4488 or danaemanika@gmail.com, or Patricia A. Stout at (512) 471 8152, or questions about the use of human subjects in research at The University of Texas at Austin should be directed to Jody Jensen, Ph.D., Institutional Review Board Chair at 512-232-2685.

Thank you very much for helping with this important survey.

Survey Questionnaire

Entrance Page Message for Survey

Welcome!

Thank you for your interest in this research project!

HPV (Human papillomavirous) is an important health-related issue, in the U.S. As a result, the need to understand more about consumer's understanding of this topic is imperative. We would like your help in answering some questions that will contribute to a better understanding of what consumers know about the topic of HPV, their perceptions and intentions. This questionnaire will take no more than 15-20 minutes to complete.

The first ten sections of the questionnaire will try to gauge your HPV knowledge and perceptions of your knowledge. Then there will be three sections that will ask you to indicate your information seeking and behavioral intentions, followed by the last section, which includes some standard demographics questions.

Rest assured that you will not be asked to identify yourself individually within the survey and any information you provide will remain strictly confidential. You may discontinue or refuse to take part at anytime and your responses will not be processed unless you submit the survey upon completion. By completing the survey you are indicating your voluntary consent to participate in this research.

Please carefully read the instructions at the beginning of each section. Most of the questions can be answered by clicking on the button(s) that best expresses your answer.

Questions about the study should be directed to Danae Manika at 512-590-4488 or danaemanika@gmail.com, or Patricia A. Stout at (512) 471 8152, or questions about the use of human subjects in research at The University of Texas at Austin should be directed to Jody Jensen, Ph.D., Institutional Review Board Chair at 512-232-2685.

Thank you very much for helping with this important survey.

1) On a scale of 1(Nothing) to (A lot), please answer the following.

- **In general, how much do you think you know about …**

…the topic of Human papillomavirous (HPV)?	Nothing A lot 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Nothing A lot 1 2 3 4 5 6 7
…the potential health consequences of having HPV?	Nothing A lot 1 2 3 4 5 6 7

2) On a scale of 1(Strongly Disagree) to (Strongly Agree), please rate the following statements.

- **I do NOT think that I know very much about…**

…HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…how to protect myself from HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…the potential health consequences of having HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7

- **Compared to most people, I am quite knowledgeable about…**

…HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…how to protect myself from HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…the potential health consequences of having HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7

3) On a scale of 1(Confident) to 7 (Not Confident), please answer the following questions.

- **How confident do you feel about your ability to…**

…make HPV prevention choices?	Confident Not at all Confident 1 2 3 4 5 6 7
…use your knowledge of HPV in making prevention choices?	Confident Not at all Confident 1 2 3 4 5 6 7
…use your knowledge of HPV in making everyday activity choices?	Confident Not at all Confident 1 2 3 4 5 6 7

4) On a scale of 1 to 7, please answer the following questions or rate the following statements.

To what extent do you personally feel you are at risk of being infected with HPV?	At no risk At great risk 1 2 3 4 5 6 7
How severe a threat is HPV to you personally?	Not at all severe Very severe 1 2 3 4 5 6 7
In general, the HPV topic is very relevant to me personally.	Not relevant Very relevant 1 2 3 4 5 6 7
Do you actively engage in any behaviors that might put you at risk of getting HPV?	Not at all A lot 1 2 3 4 5 6 7
I believe I am personally at risk for getting infected with HPV.	At no risk At great risk 1 2 3 4 5 6 7
To what extent does the HPV topic apply to your own health care decision-making personally?	Not at all A lot 1 2 3 4 5 6 7
How much of your HPV knowledge do you take into consideration, for your HPV vaccination?	None of my knowledge All of my knowledge 1 2 3 4 5 6 7
How much of your HPV knowledge do you use for your own disease prevention decisions?	None of my knowledge All of my knowledge 1 2 3 4 5 6 7
How much of your HPV knowledge do you take into consideration, for your disease prevention behavior?	None of my knowledge All of my knowledge 1 2 3 4 5 6 7

5) Please, answer the following questions by selecting one of the answers provided below.

Have you ever been vaccinated against HPV?	Yes	No	Don't know/Prefer not to disclose
Do you personally know anyone who has been vaccinated against HPV?	Yes	No	Don't know/Prefer not to disclose
Have you ever been diagnosed with HPV?	Yes	No	Don't know/Prefer not to disclose
Do you personally know anyone who has or has had HPV?	Yes	No	Don't know/Prefer not to disclose

*6) Indicate if you have **EVER** searched for, or encountered HPV information via the following information sources.*

TV	Yes	No
Radio	Yes	No
Newspapers	Yes	No
Online search engines	Yes	No
Health-related websites	Yes	No
Social networking sites (e.g., Twitter, Facebook, YouTube, etc.)	Yes	No
Online newspapers	Yes	No
Health professionals (e.g., doctor, nurse, clinic, etc.)	Yes	No
Friends or relatives	Yes	No
My employer or school	Yes	No
None	(check here if none)	
Do not recall	(check here in you do not) recall)	
Other (*please specify:*)	_____	

7) Please answer the following questions about HPV to the best of your ability.

What is "HPV"?
a. An STD (sexually transmitted disease)
b. The virus that causes AIDS
c. A type of flu
d. Don't know/Not sure

HPV transmission can happen with any skin to skin contact with the genital area of an infected person. Intercourse is NOT necessary.
a. True
b. False
c. Don't know/Not sure

HPV affects _____.
a. Only males
b. Only females
c. Both males and females
d. Don't know/ Not sure

How many types of HPV are there, which can infect the genital area?
a. 10-20
b. 20-30
c. 30-40
d. More than 40
e. Don't know/Not sure

Certain types of HPV can lead to cervical cancer in women.
a. True
b. False
c. Don't know/Not sure

Certain types of HPV can lead to genital warts.
a. True
b. False
c. Don't know/Not sure

Approximately 20 million Americans are currently infected with HPV.
a. True
b. False
c. Don't know/Not sure

Which of the following is NOT a way to reduce the risk of contracting HPV?
a. Consistent and correct use of Condoms
b. HPV Vaccination
c. Abstinence
d. Spermicide
e. Don't know/Not sure

The HPV vaccine(s) is/are NOT AT ALL effective when given after a person's first sexual contact.
a. True
b. False
c. Don't know/Not sure

An individual may have HPV even if he/she has no symptoms.
a. True
b. False
c. Don't know/Not sure

At least 50% of sexually active people will have genital HPV at some time in their lives.
a. True
b. False
c. Don't know/Not sure

The HPV vaccine(s) do(es) TREAT genital warts.
a. True
b. False
c. Don't know/Not sure

Gardasil is the brand name of an HPV vaccine.
a. True
b. False
c. Don't know/Not sure

Have you been vaccinated against HPV with Gardasil?
a. Yes
b. No
c. Don't know/Not sure

Has someone you personally know been vaccinated against HPV with Gardasil?
a. Yes
b. No
c. Don't know/Not sure

Have you ever seen a Gardasil advertisement? ***
a. Yes
b. No
c. Don't know/Not sure

*** *If selected "No" or "Don't know/Not sure" go to section 10 on page 7.*

- **Where did you see a Gardasil advertisement?**

TV	
Radio	
Newspapers	
Health-related Websites	
A health professional's office (e.g., doctor's office, clinic, hospital, etc.)	
Social networking sites (e.g., Twitter, Facebook, YouTube, etc.)	
Online newspapers	
My employer or school	
Do not recall	
Other (*please specify:*)	_____

10) Please answer the following questions about the Gardasil HPV vaccine to the best of your ability.

Gardasil can prevent all types of HPV.
a. True
b. False
c. Don't know/Not sure

Gardasil is given in three shots.
a.   True
b.   False
c.   Don't know/Not sure

11) On a scale of 1 to 7, please answer the following questions.

- **In the future, how likely are you to talk to <u>A HEALTH PROFESSIONAL (e.g., doctor, nurse, etc.)</u> about…**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to talk to your <u>FRIENDS/FAMILY</u> about…**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to search THE INTERNET for…**

…HPV-related information?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…information on how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to seek information through THE MEDIA (e.g., TV, radio, newspapers, etc.) about…**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to RELY ON WHAT YOU ALREADY KNOW, without doing any additional search for information or talking to someone about…?**

…HPV-related information?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

12) Please state your level of agreement with the following statements on a scale of 1 to 5.

I rely on others to give me information about HPV without me asking for it.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
If I am to protect myself from HPV, I have to seek information myself on HPV prevention.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I do not intend to seek any HPV-related information, from any source.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I cannot get enough information about HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I am satisfied with my level of knowledge about HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I intend to seek Gardasil related information.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I intend to actively search for information about HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I like having information about HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I intend to actively seek information on how to prevent myself from getting infected with HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	

13) Please state your level of agreement with the following statements on a scale of 1(Strongly Disagree) to 5 (Strongly Agree).

It is important to me to do everything I reasonably can to avoid getting infected with HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I will do all I know to do to prevent myself from getting infected with HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I will change my behavior to try to avoid getting infected with HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I intend to get vaccinated against HPV in the next 6 months.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I have no intention to change my behavior to avoid getting infected with HPV.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	
I do not intend to take any HPV prevention measure at all.	Strongly Disagree	Strongly Agree
	1 2 3 4 5 6 7	

14) *You're almost done! These last questions focus on basic demographics such as age, gender, and ethnicity to help us group your responses with other participants.*

What is your age? _____

What is your gender?

| Male | |
| Female | |

What is the highest level of education you have completed or the highest degree you have received?

Some high school or less	
High school graduate or equivalent	
Vocational/technical school (two year program)	
Some college but no degree	
College graduate (four year program)	
Some graduate school	
Graduate degree	
Professional degree (M.D., J.D., etc.)	
Other	

How would you classify yourself? (Select the one that fits best)

African American	
Native American	
Anglo American	
Asian American	
Hispanic American	
Multiracial	
Non-USA Native	
Other	

Approximately what is your household income, per year?

Less than $15,000	
$15,000 to $24,999	
$25,000 to $34,999	
$35,000 to 49,999	
$50,000 to 74,999	
75,000 to 99,999	
$100,000 to $149,999	
$150,000 or more	

Overall, how would you describe your health?

Poor	
Fair	
Good	
Very Good	
Excellent	

Additional Thoughts
Please share all additional thoughts you have related to HPV or Gardasil below. We are interested in anything else you might have to say.

_____
_____
_____

Thank you very much for participating in this research project. The purpose of this project is to determine consumers' knowledge of HPV, their perceptions of and intentions towards HPV information-seeking and prevention behaviors. In the end, it is hoped that the data will serve researchers and practitioners trying to better understand the role that knowledge plays in information-seeking and prevention behaviors. For more information about this project, please contact Danae Manika at danaemanika@gmail.com.

Appendix B: Final Questionnaire

Cover Letter for Internet Research
Email Message (to be sent to randomly selected panelists)

SUBJECT: You've been chosen for a survey!

You are invited to participate in a survey, entitled "Dimensions of Prior Knowledge: Implications for Information Seeking and Prevention Behaviors". The study is being conducted by Danae Manika, Ph.D. Candidate, and Patricia A. Stout, Ph.D. from the Department of Advertising of The University of Texas at Austin [Department of Advertising, A1200, The University of Texas at Austin, 1 University Station, Austin, TX 78712; Tel: (512) 590 4488 or (512) 471 8152 or].

The purpose of this study is to examine your HPV knowledge and perceptions of HPV knowledge, as well as your HPV information seeking and HPV prevention behaviors. Your participation in the survey will contribute to a better understanding of knowledge and its impact on behaviors. We estimate that it will take about **15-20 minutes** of your time to complete the questionnaire. You are free to contact the investigator at the above address and phone number to discuss the survey.

Risks to participants are considered minimal. There will be no costs for participating. There is also no direct benefit o you for participating in this study. Identification numbers associated with email addresses will be kept during the data collection phase for tracking purposes only, in order for you to receive compensation from the Authentic Response panel. Only Authentic Response contractors will have access to your personal information. This information will be stripped from the final dataset given to the investigators by the Authentic Response panel.

Your participation in this survey is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time without penalty. If you wish to withdraw from the study or have any questions, contact the investigator listed above.

If you have any questions or would like to update your email address, please call or send an email to Authentic Response. If you do not want to receive any more reminders, you may email Authentic Response.

To complete the survey, click on the link below:

This study has been reviewed and approved by The University of Texas at Austin Institutional Review Board. If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact - anonymously, if you wish - the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu.

IRB Approval Number: **2011-02-0110**

If you agree to participate please press the arrow button at the bottom right of the screen otherwise use the X at the upper right corner to close this window and disconnect.

Thank you.

Patricia Stout, Ph.D.
Danae Manika, Ph.D. Candidate
Department of Advertising
The University of Texas at Austin

Entrance Page Message for Survey

Welcome!

Thank you for your interest in this research project!

HPV (Human papillomavirous) is an important health-related issue, in the U.S. As a result, the need to understand more about consumer's understanding of this topic is imperative. We would like your help in answering some questions that will contribute to a better understanding of what consumers know about the topic of HPV, their perceptions and intentions. This questionnaire will take no more than 15-20 minutes to complete.

The first ten sections of the questionnaire will try to gauge your HPV knowledge and perceptions of your knowledge. Then there will be three sections that will ask you to indicate your information seeking and behavioral intentions, followed by the last section, which includes some standard demographics questions.

Rest assured that you will not be asked to identify yourself individually within the survey and any information you provide will remain strictly confidential. You may discontinue or refuse to take part at anytime and your responses will not be processed unless you submit the survey upon completion. By completing the survey you are indicating your voluntary consent to participate in this research.

Please carefully read the instructions at the beginning of each section. Most of the questions can be answered by clicking on the button(s) that best expresses your answer.

Questions about the study should be directed to Danae Manika at 512-590-4488 or danaemanika@gmail.com, or Patricia A. Stout at (512) 471 8152, or questions about the use of human subjects in research at The University of Texas at Austin should be directed to Jody Jensen, Ph.D., Institutional Review Board Chair at 512-232-2685.

Thank you very much for helping with this important survey.

Survey Questionnaire

Entrance Page Message for Survey

Welcome!

Thank you for your interest in this research project!

HPV (Human papillomavirous) is an important health-related issue, in the U.S. As a result, the need to understand more about consumer's understanding of this topic is imperative. We would like your help in answering some questions that will contribute to a better understanding of what consumers know about the topic of HPV, their perceptions and intentions. This questionnaire will take no more than 15-20 minutes to complete.

The first ten sections of the questionnaire will try to gauge your HPV knowledge and perceptions of your knowledge. Then there will be three sections that will ask you to indicate your information seeking and behavioral intentions, followed by the last section, which includes some standard demographics questions.

Rest assured that you will not be asked to identify yourself individually within the survey and any information you provide will remain strictly confidential. You may discontinue or refuse to take part at anytime and your responses will not be processed unless you submit the survey upon completion. By completing the survey you are indicating your voluntary consent to participate in this research.

Please carefully read the instructions at the beginning of each section. Most of the questions can be answered by clicking on the button(s) that best expresses your answer.

Questions about the study should be directed to Danae Manika at 512-590-4488 or danaemanika@gmail.com, or Patricia A. Stout at (512) 471 8152, or questions about the use of human subjects in research at The University of Texas at Austin should be directed to Jody Jensen, Ph.D., Institutional Review Board Chair at 512-232-2685.

Thank you very much for helping with this important survey.

1) On a scale of 1(Nothing) to (A lot), please answer the following.

- **In general, how much do you think you know about …**

…the topic of Human papillomavirous (HPV)?	Nothing A lot 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Nothing A lot 1 2 3 4 5 6 7
…the potential health consequences of having HPV?	Nothing A lot 1 2 3 4 5 6 7

2) On a scale of 1(Strongly Disagree) to (Strongly Agree), please rate the following statements.

- **Compared to most people, I am quite knowledgeable about…**

…HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…how to protect myself from HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
…the potential health consequences of having HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7

3) On a scale of 1(Confident) to 7 (Not Confident), please answer the following questions.

- **How confident do you feel about your ability to…**

…make HPV prevention choices?	Confident Not at all Confident 1 2 3 4 5 6 7
…use your knowledge of HPV in making prevention choices?	Confident Not at all Confident 1 2 3 4 5 6 7
…use your knowledge of HPV in making everyday activity choices?	Confident Not at all Confident 1 2 3 4 5 6 7

4) On a scale of 1 to 7, please answer the following questions or rate the following statements.

To what extent do you personally feel you are at risk of being infected with HPV?	At no risk At great risk 1 2 3 4 5 6 7
How severe a threat is HPV to you personally?	Not at all severe Very severe 1 2 3 4 5 6 7
In general, the HPV topic is very relevant to me personally.	Not relevant Very relevant 1 2 3 4 5 6 7
Do you actively engage in any behaviors that	Not at all A lot

might put you at risk of getting HPV?	1 2 3 4 5 6 7
I believe I am personally at risk for getting infected with HPV.	At no risk At great risk 1 2 3 4 5 6 7
To what extent does the HPV topic apply to your own health care decision-making personally?	Not at all A lot 1 2 3 4 5 6 7

5) Please, answer the following questions by selecting one of the answers provided below.

Have you ever been vaccinated against HPV?	Yes	No	Don't know/Prefer not to disclose
Do you personally know anyone who has been vaccinated against HPV?	Yes	No	Don't know/Prefer not to disclose
Have you ever been diagnosed with HPV?	Yes	No	Don't know/Prefer not to disclose
Do you personally know anyone who has or has had HPV?	Yes	No	Don't know/Prefer not to disclose

6) Please answer the following questions about HPV to the best of your ability.

What is "HPV"?
 a. An STD (sexually transmitted disease)
 b. The virus that causes AIDS
 c. A type of flu
 d. Don't know/Not sure

HPV transmission can happen with any skin to skin contact with the genital area of an infected person. Intercourse is NOT necessary.
 a. True
 b. False
 c. Don't know/Not sure

HPV affects _____.
 a. Only males
 b. Only females
 c. Both males and females
 d. Don't know/ Not sure

How many types of HPV are there, which can infect the genital area?
 a. 10-20
 b. 20-30
 c. 30-40
 d. More than 40
 e. Don't know/Not sure

Certain types of HPV can lead to cervical cancer in women.
 a. True

b. False
c. Don't know/Not sure

Certain types of HPV can lead to genital warts.
   a. True
   b. False
   c. Don't know/Not sure

Approximately 20 million Americans are currently infected with HPV.
   a. True
   b. False
   c. Don't know/Not sure

Which of the following is NOT a way to reduce the risk of contracting HPV?
   a. Consistent and correct use of Condoms
   b. HPV Vaccination
   c. Abstinence
   d. Spermicide
   e. Don't know/Not sure

The HPV vaccine(s) is/are NOT AT ALL effective when given after a person's first sexual contact.
   a. True
   b. False
   c. Don't know/Not sure

An individual may have HPV even if he/she has no symptoms.
   a. True
   b. False
   c. Don't know/Not sure

At least 50% of sexually active people will have genital HPV at some time in their lives.
   a. True
   b. False
   c. Don't know/Not sure

The HPV vaccine(s) do(es) TREAT genital warts.
   a. True
   b. False
   c. Don't know/Not sure

Gardasil is the brand name of an HPV vaccine.
   a. True
   b. False
   c. Don't know/Not sure

Have you been vaccinated against HPV with Gardasil?
   a. Yes
   b. No

c. Don't know/Not sure	

Has someone you personally know been vaccinated against HPV with Gardasil?
a.   Yes
b.   No
c.   Don't know/Not sure

Have you ever seen a Gardasil advertisement? ***
a.   Yes
b.   No
c.   Don't know/Not sure

*** If selected "No" or "Don't know/Not sure" go to section 10 on page 7.*

- **Where did you see a Gardasil advertisement?**

TV	
Radio	
Newspapers	
Health-related Websites	
A health professional's office (e.g., doctor's office, clinic, hospital, etc.)	
Social networking sites (e.g., Twitter, Facebook, YouTube, etc.)	
Online newspapers	
My employer or school	
Do not recall	
Other (*please specify:*)	_____

7) Please answer the following questions about the Gardasil HPV vaccine to the best of your ability.

Gardasil can prevent all types of HPV.
a.   True
b.   False
c.   Don't know/Not sure

Gardasil is given in three shots.
a.   True
b.   False
c.   Don't know/Not sure

8) On a scale of 1 to 7, please answer the following questions.

- **In the future, how likely are you to talk to <u>A HEALTH PROFESSIONAL (e.g., doctor, nurse, etc.) about…</u>**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to talk to your <u>FRIENDS/FAMILY</u> about…**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to search <u>THE INTERNET</u> for…**

…HPV-related information?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…information on how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to seek information through THE MEDIA (e.g., TV, radio, newspapers, etc.) about…**

…HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

- **In the future, how likely are you to RELY ON WHAT YOU ALREADY KNOW, without doing any additional search for information or talking to someone about…?**

…HPV-related information?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…how to protect yourself from HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…potential health consequences of having HPV?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7
…Gardasil?	Extremely likely Extremely Unlikely 1 2 3 4 5 6 7

9) Please state your level of agreement with the following statements on a scale of 1 to 5.

I intend to seek Gardasil related information.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
I intend to actively search for information about HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
I like having information about HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
I intend to actively seek information on how to prevent myself from getting infected with HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7

10) Please state your level of agreement with the following statements on a scale of 1(Strongly Disagree) to 5 (Strongly Agree).

It is important to me to do everything I reasonably can to avoid getting infected with HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
I will do all I know to do to prevent myself from getting infected with HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7
I will change my behavior to try to avoid getting infected with HPV.	Strongly Disagree Strongly Agree 1 2 3 4 5 6 7

14) You're almost done! These last questions focus on basic demographics such as age, gender, and ethnicity to help us group your responses with other participants.

What is your age? _____

What is your gender?

Male	
Female	

What is the highest level of education you have completed or the highest degree you have received?

Some high school or less	
High school graduate or equivalent	
Vocational/technical school (two year program)	
Some college but no degree	
College graduate (four year program)	
Some graduate school	
Graduate degree	
Professional degree (M.D., J.D., etc.)	
Other	

How would you classify yourself? (Select the one that fits best)

African American	
Native American	
Anglo American	
Asian American	
Hispanic American	
Multiracial	
Non-USA Native	
Other	

Approximately what is your household income, per year?

Less than $15,000	
$15,000 to $24,999	
$25,000 to $34,999	
$35,000 to 49,999	
$50,000 to 74,999	
75,000 to 99,999	
$100,000 to $149,999	
$150,000 or more	

Overall, how would you describe your health?

Poor	
Fair	
Good	
Very Good	
Excellent	

Additional Thoughts

Please share all additional thoughts you have related to HPV or Gardasil below. We are interested in anything else you might have to say.

_____
_____
_____

Thank you very much for participating in this research project. The purpose of this project is to determine consumers' knowledge of HPV, their perceptions of and intentions towards HPV information-seeking and prevention behaviors. In the end, it is hoped that the data will serve researchers and practitioners trying to better understand the role that knowledge plays in information-seeking and prevention behaviors. For more information about this project, please contact Danae Manika at danaemanika@gmail.com.

Appendix C: Knowledge Test Score Answers

The following answers to the knowledge test score was verified by Gulielma Leonard Fager, MPH; Healthy Sexuality Education Coordinator at The University of Texas at Austin. Emails exchanged regarding the verification process are also included.

What is "HPV"?
a. An STD (sexually transmitted disease)
b. The virus that causes AIDS
c. A type of flu
d. Don't know/Not sure

HPV transmission can happen with any skin to skin contact with the genital area of an infected person. Intercourse is NOT necessary.
a. True
b. False
c. Don't know/Not sure

HPV affects _____.
a. Only males
b. Only females
c. **Both males and females**
d. Don't know/ Not sure

How many types of HPV are there, which can infect the genital area?
a. 10-20
b. 20-30
c. 30-40
d. More than 40
e. Don't know/Not sure

Certain types of HPV can lead to cervical cancer in women.
a. True
b. False
c. Don't know/Not sure

Certain types of HPV can lead to genital warts.
a. True
b. False
c. Don't know/Not sure

Approximately 20 million Americans are currently infected with HPV.
a. True
b. False
c. Don't know/Not sure

Which of the following is NOT a way to reduce the risk of contracting HPV?
a. Consistent and correct use of Condoms
b. HPV Vaccination
c. Abstinence
d. Spermicide
e. Don't know/Not sure

The HPV vaccine(s) is/are NOT AT ALL effective when given after a person's first sexual contact.
a. True
b. False
c. Don't know/Not sure

An individual may have HPV even if he/she has no symptoms.
a. True
b. False
c. Don't know/Not sure

At least 50% of sexually active people will have genital HPV at some time in their lives.
a. True
b. False
c. Don't know/Not sure

The HPV vaccine(s) do(es) TREAT genital warts.
a. True
b. False
c. Don't know/Not sure

Gardasil is the brand name of an HPV vaccine.
a. True
b. False
c. Don't know/Not sure

Gardasil can prevent all types of HPV.
a. True
b. **False**
c. Don't know/Not sure

Gardasil is given in 3 shots.
a. True
b. False
c. Don't know/Not sure

Appendix D: Post-hoc Analysis with Regressions

Based on a post hoc analysis using regressions results regarding the prevention behavior model varied significantly from the structural equation modeling results (but not for the information-seeking model). These differences between the results from the regressions and the ones from the structural equation modeling, is ordinary. When using composites instead of latent variables a lot of information is lost, which is why structural equation modeling is considered a more valid and reliable analysis technique. Regression results are shown in Tables 14 and 15.

Independent Variables	Standard Error	Beta	t	p
(Constant)	.164		14.013	.00
Self-Perceived Knowledge Amount	.031	.182	5.339	.00
Knowledge Use Confidence	.012	.045	1.557	.12
Personal Knowledge	.032	.267	10.081	.00
Knowledge Test Score	.013	-.023	-.689	.49
Experiential Knowledge	.026	.018	.571	.57

R^2=.125, Std.Error=1.484, F(5,1412)=40.284, p<.01

Table 14:   Information-seeking Regression Model

Independent Variables	Standard Error	Beta	t	p
(Constant)	.175		21.692	.00
Self-Perceived Knowledge Amount	.033	.134	3.840	.00
Knowledge Use Confidence	.025	-.041	-1.404	.16
Personal Knowledge	.034	.090	3.313	.00
Knowledge Test Score	.014	.063	1.823	.07
Experiential Knowledge	.027	.078	2.481	.01

[a]R^2=.081, Std.Error=1.600, F(5,1413)=24.807, p<.01

Table 15:   Prevention Behavior Regression Model

However, the regression of the prevention behavior intentions model showed some interesting results in relation to personal knowledge. In the prevention behavior regression, effects were swapped for personal knowledge and knowledge test score. Personal knowledge was found to be a significant predictor of prevention behaviors, and knowledge test score was found to be non-significant, based on the regressions results. The structural model results showed that personal knowledge was not significant and knowledge test score to be significant.

This inconsistency might hide valuable information regarding the importance of personal knowledge, since knowledge test score was a composite score for both the regression and the structural model results. Further research is needed to evaluate the reasons behind these results and improve guidelines for future research.

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