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CONSUMERS' RISK PERCEPTIONS OF OTC COLD MEDICATIONS AND INFORMATION SEARCH

by

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DTC could decrease the risk-perception ?

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ABSTRACT

This research studied perceived risk and information search related to over-the-counter (OTC) cold medications. The first study objective was to present a conceptual model of overall perceived risk and information search. The second objective was to study how consumers' overall perceived risk of a hypothetical OTC cold product influenced their extrinsic search for information and sources of information that they preferred and intended to use.

Bettman (1973) and Dowling and Staelin's (1994) concepts of perceived risk were adapted for application to pharmacy. Overall Perceived Risk was proposed to comprise of three components: Product Category Risk, Product Specific Risk and Situation Specific Risk. It was hypothesized that consumers with higher overall perceived risk would search for more information and intend to use and prefer more expert interpersonal sources of information such as the pharmacist and the physician.

A randomized experimental 2 x 2 factorial design was employed to examine the effects of Product Specific Risk and Situation Specific Risk on information search. Perceived risk construct manipulations consisted of varying the number of side effects on the OTC label (two versus four) and the severity of a past health problem (rash versus hepatitis). A judgment sample of 160 university students was given a label with either two or four side effects for a hypothetical OTC cold medication called Cold-Arrest and asked to rate their overall perceived risk of using the product when they had had a rash or hepatitis in the past. They also were asked whether they would search for additional information after reading the label and the information source they would prefer and intend to use. Data analysis consisted

of univariate analyses using Student's t-tests and Chi-square tests, and multivariate analyses using logistic regression.

Respondents perceived Cold-Arrest as more risky than cold OTCs in general. When comparing the risk of using Cold-Arrest across side effects and past health problems, respondents perceived highest risk when using the OTC product with four side effects and having had hepatitis, and lowest with two side effects and having had a rash. Overall perceived risk was significantly higher for respondents who would search for more information. Logistic regression also showed overall perceived risk to be the best predictor of information search. Additionally, when overall perceived risk increased, while respondents would use the pharmacist most often, they actually preferred to use the physician.

Past pharmacy research has traditionally studied only the component of Product Category Risk of OTC medications. This might have resulted in lower risk perceptions of OTCs measured in existing risk literature. The results of this study suggested that it is important to examine the two additional components of Product Specific Risk and Situation Specific Risk in future research.

CHAPTER 1

INTRODUCTION

In the past 20 years, prescription drugs have increasingly been approved by the Food and Drug Administration (FDA) to switch to over-the-counter (OTC) status. Today there are more than 75 ingredients, dosage forms and dosage strengths previously available by prescription only and now also available as OTCs (Soller, 1998).

One important and historical role of pharmacists has been to provide consumers with drug information to assist in making appropriate decisions regarding all types of medications (Cosler, Schulz, Baldwin and Cohen, 1986). A key assumption of OTC status is that consumers are able to correctly self-diagnose the condition for which the OTC drug is to be used. Therefore, with the growth of the OTC market and an aging population, the potential for misuse or interaction of OTCs with other medications may increase because the purchase of an OTC does not require contact with an informed health care professional. It thus becomes more important than ever for pharmacists to expand their role in OTC consultation.

According to a 1997 national survey on OTC and prescription use in the U.S., one-third (35%) of the respondents thought OTCs were very safe, while 50 percent considered them somewhat safe (American Pharmaceutical Association, 1997). Only twelve percent were concerned that OTC products were unsafe. Bissell, Ward and Noyce (2000) found that consumers generally were not concerned about the risks associated with OTCs and that they tended to focus more on the benefits rather than the risks of these medications. Knapp and Knapp (1980) reported that only ten percent of consumers purchasing OTC medications obtained any pharmacist advice regarding the product, and in less than one percent of the

purchases was information provided on product characteristics such as side effects and effectiveness.

While the aforementioned information seems to indicate that OTCs are generally perceived as being safe by the public, several pharmacy studies suggest that OTC perceived risk can be influenced by a number of different factors. Charupatanapong (1994) found that those who had experienced health problems in the past perceived a higher likelihood of risk in their self-medication practices than those who had not. Additionally, safety and performance risks were the best predictors of consumers' perceived likelihood of overall risk in their self-medication practices for minor eye problems and minor fatigue respectively (Charupatanapong, 1994). In their study of elderly's risk perceptions of generic OTC medications, Strutton, Lumpkin and Vitell (1992) found that both users and nonusers of generic OTCs believed that physical and performance risk were the most important characteristics of generic drugs. These results suggest that consumers do not perceive OTCs with the same level of risk in different usage situations. Additionally, there are several different types of perceived risk associated with OTCs of which safety or physical risk is one.

Cosler et al. (1986) found that the fundamental motive for preferring drug information from a physician or pharmacist was perceived drug importance. For drug categories that included prescription only and nonprescription drug products such as cough/cold products, antidiarrheals and laxatives, respondents preferred the pharmacist and physician equally. They also would question a pharmacist on drugs of medium to low importance. However, respondents overwhelmingly preferred the physician as the information source for antihypertensives and antibiotics which were almost exclusively by prescription only. These findings suggest that consumers use different sources in acquiring

information and that drug categories have different levels of perceived importance for consumers.

Therefore, a consumer's decision to seek a pharmacist's advice concerning an OTC purchase can be influenced by the level and type of risk that the consumer perceives in the OTC product and its drug category. A consumer may also seek different channels of information for different levels and types of perceived risk. Subsequently, understanding more about consumers' OTC risk perceptions should help to identify the facilitators and barriers of an OTC consultation which could be very important in expanding the pharmacist's role as an OTC drug advisor, especially in the present environment with a trend toward self-care and increasing medication switches from prescription only to OTC status.

This research built on previous research to examine several unanswered questions. First, very little past research in pharmacy has studied consumers' risk perceptions of OTCs in specific usage situations. Second, to the best of this researcher's knowledge, no published study has specifically investigated the effects of OTC risk perceptions on obtaining pharmacist advice to reduce the level of that risk.

Therefore, the objective of this exploratory research was to propose a conceptual model of overall perceived risk and extrinsic search for information. The primary research question was to study the effects of perceived risk of an OTC cold medication on consumers' search for information. The secondary question was to study the effects of perceived risk on consumers' choice of information source. It was hypothesized that consumers with higher overall perceived risk would be more likely to search for additional information and use expert sources of information, specifically the pharmacist and the physician, as a risk-reduction strategy.

CHAPTER 2

LITERATURE REVIEW

An elaborate literature on perceived risk exists. The construct of perceived risk has been defined in many different ways and has been applied across a wide range of disciplines from economics, psychology, statistical decision theory, marketing to pharmacy.

The marketing literature typically defines the perceived risk construct as consisting of two dimensions: uncertainty and adverse consequences. While both dimensions of perceived risk are typically measured, consumer researchers tend to focus more on decreasing perceived risk by decreasing uncertainty through additional information acquisition because most of the products studied in that discipline are non-medical consumer goods with low safety risks.

The medical literature emphasizes measuring the seriousness and probability of (or susceptibility to) an adverse consequence occurring, and giving suggestions of proper risk education, in both assessment and management, so that these risky behaviors can be modified.

The majority of past pharmacy literature has utilized the economic and marketing theoretical frameworks of perceived risk, usually by measuring the likelihood or probability of the occurrence of an adverse consequence for different types of risk. However, unlike in consumer research, not much empirical work has been done in both medical and pharmacy literature to study the relationship between perceived risk and information acquisition.

The focus of the medical literature is more on studying perceived risks of a health condition or behavior in a population at risk, e.g., heart disease and cancer among cigarette

smokers (Ayanian and Cleary, 1999), alcohol use during pregnancy (Testa and Reifman, 1996), and perceptions of AIDS risk (Prohaska, Albrecht, Levy, Sugrue and Kim, 1990). Since the main focus here is on OTC products rather than on risky behaviors, this research will therefore only draw from the marketing and pharmacy literature.

In this chapter, the following will be presented. First, relevant marketing literature and findings from past pharmacy studies are discussed. Next, the theoretical framework and definitions related to perceived risk and information search proposed and used in this research will be described. Finally, study objectives, and research questions and hypotheses will be given.

MARKETING LITERATURE

A. Conceptual Definition of Perceived Risk:

Perceived risk can be defined in many ways. All agree that it is a complex multidimensional construct even though it may not be operationalized as such.

Perceived risk was originally introduced in 1960 to the marketing literature by Bauer who defined it as having a two-dimensional structure: *uncertainty* and *adverse consequences*. Bauer explained that: "Consumer behavior involves risk in the sense that any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant" (c1960, reprinted in 1967, p.24). Bauer also emphasized that he was referring to subjective or perceived risk, not "real world" or objective risk.

Applying Bauer's (1960) concept of perceived risk, Cox (1967d) explained that a situation is defined as one of perceived risk if one or more of the following three factors are present in the mind of the consumer:

1. *Goal uncertainty*: uncertainty as to what the buying goals are (e.g., the nature and acceptance levels of buying goals, and the relative importance and the degree of achieving those goals).
2. *Product uncertainty*: uncertainty as to which purchase (e.g., product, brand, model, style, size, etc,) will best match or satisfy acceptance levels of buying goals.
3. *Possibility of adverse consequences*: perception of possible adverse consequences if the purchase results in a failure to attain buying goals.

Subsequent consumer research has typically studied the subjective probability of *adverse* consequences. Consumers are assumed to act to reduce any expected negative utility associated with purchase behavior (Peter and Tarpey, 1975). Peter and Tarpey (1975) were the first to consider the probability of *fortuitous* as well as adverse consequences occurring when they tested the perceived risk, perceived returns and net perceived return models on car brand preferences. Dowling and Staelin (1994) also studied the possibility of both positive and negative consequences for the purchase of new dresses.

Additionally, not all researchers have used *consequences* as the second dimension of perceived risk. Cunningham (1967) referred to it as "danger" while Schiffman (1972), Taylor (1974) and Peter and Tarpey (1975) used "importance." Bettman (1973) described risk present in any choice situation to be a function of two components: the *probability of a loss* occurring and *the importance of the loss* if it were to occur. He explained that: "The risk inherent in a brand choice situation within a product class will depend on the degree to which

consumers believe they can construct a reasonable decision rule for making brand choice, and its importance to them in making a satisfactory choice within that product class" (1973, p.184-185).

Similarly, Cox (1967b) suggested that the amount of perceived risk in any act is a function of two factors: the individual's subjective degree of certainty that the consequences will be unfavorable, and the amount at stake or to be lost if the consequences of the act were not favorable. In other words, the greater the subjective probability of loss occurring, the higher the amount of risk (Cox, 1967b). Furthermore, risk is involved when there is a possibility of not satisfying a consumer's needs or goals, and when the amount of stake for the consumer is a function of goal importance, consequence seriousness if the goal is not attained, and the amount of means used in achieving the goals (Cox, 1967b).

B. Types of Perceived Risk:

Expanding on the adverse consequence dimension of perceived risk, researchers have proposed at least six types or facets of loss: performance, social, psychological, physical or safety, and financial (Jacoby and Kaplan, 1972), and time or convenience loss (Roselius, 1971). Since some product classes can be perceived as more risky than others, different sets of adverse consequences are associated with different product classes. Most research has subsequently incorporated one or more types of loss and present overall perceived risk as a two dimensional, multifaceted construct (e.g., Peter and Tarpey, 1975; Dowling and Staelin, 1994).

Additionally, Bettman (1973) proposed two different types of risk: inherent and handled. Inherent risk is the latent risk that a product class holds for a consumer, i.e., the

innate degree of risk for that product class. Handled risk is the amount of risk when the consumer chooses a brand from a product class in a particular buying situation. Bettman further suggested that handled risk "represents the end results of the action of information and risk reduction processes on inherent risk" (1973, p.184). When the consumer has no additional information about a brand in a product class, handled and inherent risk should be the same. Different product classes also have varying levels of inherent risk due to their product nature and importance or salience to the consumer. Other studies have also expanded on Bettman's (1973) model of inherent risk and handled risk (e.g., Dowling and Staelin, 1994).

In Dowling and Staelin's (1994) model, overall perceived risk is partitioned into three components of which the first two are analogous to Bettman's (1973) model of inherent risk and handled risk respectively. First, product-category risk (PCR) is the person's perception of the riskiness of buying any brand in a specific product class. A person with a higher PCR will perceive buying any brand in that product class as more risky than a person with a lower PCR. The second component is product-specific risk (SR) and reflects the perceived risk of buying a specific brand in the product class. Consumers also evaluate brand attributes and other relevant factors associated with the usage situation relative to their purchase goals. Acceptable risk (AR) is the third major component, Dowling and Staelin (1994) describing it as the point above which a brand has an unacceptable level of perceived risk to purchase. Individuals with high levels of PCR will have lower values of AR.

In short, the marketing literature defines risk as a function of two elements, uncertainty and consequences. *Uncertainty* may be about the nature and acceptance level of buying goals, and the probability of attaining those goals or of adverse consequences

happening (Cox, 1967b). *Consequences* may relate to different types of goals (e.g., performance or financial goals), to the means invested (e.g., money, time and effort) to attain those goals, and the importance or amount at stake if the goals are not attained. The greater the importance placed on attaining the goal, the more serious the adverse consequences of failing to attain that goal (Cox, 1967b).

C. Reducing Perceived Risk through Information Search:

Perceived risk can be reduced in several ways. According to Cox (1967c), consumers first assess the nature and degree of perceived risk in purchase situations. They will then act in accordance with the level and nature of perceived risk relative to their acceptable levels and types of perceived risk. Some consumers may decide that the situation is more risky than their acceptable level and take steps to reduce that risk. Some consumers on the other hand may decide that the risk is within their tolerance range and will not need to act to reduce risk.

Since perceived risk is a function of outcome uncertainty and consequences, it can be reduced by operating on any of these two components, specifically by increasing certainty and/or by reducing the consequences or the amount at stake (Taylor, 1974; Cox, 1967c). However, consumer research shows that virtually all risk-reducing strategies employed by consumers operate primarily on the uncertainty component of risk (Roselius, 1971). Lutz and Reilly (1974) argued that this is hardly surprising since it is difficult to reduce the importance of consequences or the amount of stake, e.g., the consumers would have to convince themselves that their purchase decisions are not important.

Brand loyalty, personal and group influence, and other decision heuristics such as the most expensive brand or an advertised brand can be used to reduce uncertainty when the functions or characteristics of a brand are difficult to assess or when all brands in a product class work equally well (Bauer, c1960; Lutz and Reilly, 1974). For example, Coleman, Katz and Mentzel (1957) found that physicians adopted new drugs by following the lead of respected colleagues when adequate drug information was lacking.

Another strategy identified in consumer research for reducing uncertainty is through information handling (Cunningham, 1967; Bettman, 1973). Much of the available research focuses on three subdivisions of information handling: acquisition, transmission, and processing (Cox, 1967c). The information acquisition part of the theory presents that there are different channels of information available to the consumer and that the different channels are appropriate in reducing various types of risk (Cox, 1967c).

Roselius (1971) studied eleven methods of risk relief and found that consumers considered brand loyalty, major brand image and government testing to be applicable for hazard loss. Cunningham (1967) found reliance on word-of-mouth to reduce high perceived risk in his study of headache remedies, fabric softeners, and dry spaghetti. Therefore, there are indications that different levels and types of perceived risk affect the channels of information that consumers use to reduce risk.

D. Sources of Information:

According to Murray (1991), consumer information sources used by consumers to gather information and cope with perceived risk can be classified broadly into two types: internal and external sources. People may rely solely on their internal sources, e.g., previous

personal experience and knowledge, and do not acquire new information about the brand being considered.

However, when a problem cannot be resolved with an evaluation of stored information that the consumer already has in memory, there is a need to collect additional information from external sources before making a purchase decision (Murray, 1991). This information can include the opinions of friends and family, professional information provided in articles and books, and marketer-generated information such as advertisements. It is assumed that the consumer tends to select those sources which will most likely provide him or her with information to reduce uncertainty for the type of risk perceived to be greatest in that situation (Lutz and Reilly, 1974).

In a choice model of consumer attitudes and behavior, Andreasen (1968) has further classified external information sources used to reach a decision into four categories: advocate impersonal (e.g., advertisements), independent impersonal (e.g., popular or professional articles, television or radio programs), advocate personal (e.g., salespersons or retail clerks), and independent personal (e.g., family members, friends and associates) sources.

Cox (1967a) has also suggested another way of categorizing information sources into three channels: consumer dominated, marketer dominated and neutral sources. Marketer dominated sources (e.g., the product itself, packaging, advertising) are controlled by the marketer while consumer dominated sources (e.g., friends and family) refer to interpersonal sources of information not under the direct control of the marketer. Neutral sources (e.g., consumer reports, newspaper articles) are controlled by neither the marketer nor by the consumer. According to Cox (1967a), consumers use these three types of channels as complementary rather than competing sources of information.

Researchers (e.g., Cunningham, 1967; Arndt, 1967) have found that people with higher perceived risk were more likely to use consumer dominated informational channels and engage in word-of-mouth discussion to reduce purchase uncertainty. Lutz and Reilly (1974) further noted that consumers used more sources of information when faced with increasing levels of perceived performance risk.

In short, reducing perceived risk through information acquisition can be best concluded with Cox's words: "The amount and nature of perceived risk will define consumer information needs, and consumers will seek out sources, types, and amounts of information that seem most likely to satisfy their particular information needs" (1967c, p.604).

PHARMACY LITERATURE

A. Conceptual Definition of Perceived Risk:

Pharmacy literature has looked at risk in two different streams of research. The first, along with research done in medicine, is focused on risk assessment and management of prescription medications through risk disclosure by looking specifically at the content and type of risk information (e.g., the side effects of medication or therapy). The main theme is how to frame risk information and whether or not it should be communicated to patients with the foremost concern being that negative information would make patients less likely to comply with the medication or therapy regimen (Morris, 1990). Because framing risk information is beyond the scope of this research, those studies will not be described here.

The other stream of research applies the concept of perceived risk as defined by the economics and marketing theoretical frameworks to study prescription medications (e.g., Brown, Wastila, Barash and Lasagna, 1990; Ganther and Kreling, 2000; Kare, Kucukarslan

and Birdwell, 1996; Lively, Baldwin, Carlton and Riley, 1981; Slovic, Kraus, Lappe and Major, 1991). Not much has been done to study OTC risk perceptions because OTCs are traditionally perceived as being less important and less risky than prescription medications.

While both OTC and prescription medications share some similar characteristics, e.g., those with the same active ingredients will have the same side effects, they are also very different in terms of cost, accessibility, and regulatory and labeling requirements. However, even though the focus of this research is on OTC medications only, several studies pertaining to prescription medications will also be described in the following section. Since OTC risk research is scarce, it can prove useful to learn from what has already been explored about perceived risk of prescription medications.

Kare et al. (1996) used Jacoby and Kaplan's (1972) conceptualization of five risk components (performance, financial, physical, psychological, and social) to study perceived risk of four different types of prescription drug categories: cough/cold products, antihypertensives, sedatives, and hypnotics. They found that consumers were able to discern among the different types of prescription drugs and that chronic use of antihypertensives was associated with a higher level of perceived risk than for cough/cold products. Sedatives and hypnotics had the highest level of overall perceived risk. Performance risk was higher for cough/cold products than for antihypertensives while the reverse was true for safety risk. Safety risk also accounted for 53 to 61 percent of the variance associated with overall perceived risk for all four drug categories (Kare et al., 1996).

Additionally, a survey examining risk perceptions of prescription drugs in Canada (Slovic et al., 1991) found that sleeping pills, tranquilizers and antidepressants were highest

in perceived risk while vitamin pills, herbal medicines, vaccines and acupuncture were perceived as lowest risk.

In the area of prescription medications, several studies (e.g., Ganther and Kreling, 2000) have also measured perceived risk of generic drugs. However, that topic is beyond the scope of this research and will be not be described here. The next section presents pharmacy studies on OTC risk perceptions and information sources.

B. OTC Risk Perceptions and Information Sources:

Charupatanapong (1991 with Rascati; 1994; 1996) has conducted a series of studies examining consumers' risk perceptions of self-medication practices. For example, Charupatanapong and Rascati (1991) measured one dimension of perceived risk by comparing the likelihood of an adverse consequence occurring for six different types of risk (performance, safety, convenience, financial, social and psychological) between Thai consumers' self-treatment and physician treatment of three health problems (cough, diarrhea, and coughing up blood) and in two time frames (today and several days). Psychological risk accounted for the most variance in cases of cough/several days and coughing up blood/today while performance risk accounted for the most variance in cases of cough/today, diarrhea/today and diarrhea/several days (Charupatanapong and Rascati, 1991). These findings suggest that consumers associate different levels and types of risk to different health problems and duration of symptom manifestation.

Another study by Charupatanapong in 1996 utilized a perceived risk questionnaire adapted from Peter and Tarpey's (1975) model which defined risk perception as a

multiplicative function between the probability of loss and the importance of loss to measure the elderly's risk perceptions of OTC laxatives.

Strutton et al. (1992) also used a multiplicative model of probability and importance to measure perceived risk of generic OTCs for five different types of risk (physical, financial, performance, psychological and social). They found that physical and performance risk significantly contributed to the adoption of generic OTCs by the elderly. Users were more likely to perceive generic OTCs as possessing significantly less physical and performance risk than nonusers.

While to the best of this researcher's knowledge, no pharmacy study has investigated the effects of perceived risk on information search, there are several that have explored consumers' sources of information for OTCs.

Boatman and Gagnon (1977) grouped information sources on OTC drugs into seven major categories: health professionals, printed publications, relatives and friends, broadcast media, market and sales agent, educational instructions, and other. Strutton and Lumpkin (1992) factor analyzed fifteen OTC information sources and found different components of source importance between vitamins and analgesics.

Pharmacy studies have found that consumers rely on expert sources of information such as pharmacists and physicians in addition to non-expert sources such as family and friends for OTC advice. This is different from the findings in the marketing literature in which more consumer-dominated channels such as word-of-mouth are trusted and utilized.

In their study of perceived need for information and preferred sources of information on OTCs, Schefcheck and Thomas (1997) found that respondents rated pharmacists highest as a source of information assistance for OTCs from among physicians, nurses, and family

and friends. Respondents also perceived a high need for information assistance when using OTCs.

According to the 1997 APhA study on OTC and prescription use, seventy percent of the respondents depended on their pharmacists for information about OTCs, while 8 percent used information on the product label, and 75 percent consulted their physician. Sixty-four percent received advice from family and friends. Consumers also used other sources of information such as advertising (42%), books (42%) and magazines (36%) (APhA, 1997). Only forty-three percent trusted the product label a lot to provide accurate information while approximately two-thirds trusted physicians and pharmacists a lot. Significantly fewer consumers trusted friends or family members (38%), books (27%), and advertising (12%) to provide accurate information about OTCs (APhA, 1997).

Research has found age and current use of prescription medications as good predictors of whether or not consumers will talk to a pharmacist when choosing an OTC. Seniors and people taking prescription medications were more likely to ask a pharmacist to help them make an OTC purchase decision (APhA, 1997). Portner and Smith (1994) found that college students identified formal sources, physicians and pharmacists, as the most accurate, most expensive, most time-consuming and least convenient for OTC information.

In conclusion, pharmacy research on both prescription and OTC medications suggest that consumers associate different levels and types of perceived risk with different drug categories. However, OTCs are a unique type of product because they share many of the same characteristics of non-medical consumer goods in addition to those of prescription drugs. While they are drug products, they are also easily accessible and available without a

physician's prescription or advice from any health care professional. They are also perceived to be safer than prescription drugs.

Yet when results are compared between pharmacy and marketing studies on perceived risk, the findings suggest that consumers do perceive physical risk as an important component of OTC medications but not for non-medical consumer goods. This has implications for the Food and Drug Administration's (FDA) present OTC labeling requirement (Federal Register, 1999) that standardizes and reduces the amount of risk information on the label in an effort to increase consumers' levels of comprehension in a way that is very similar to standardized food labels. It remains to be seen whether or not the new OTC labeling requirement will result in a change in consumers' risk perceptions of OTCs and how it will affect their seeking pharmacists' counsel in their role as an OTC advisor.

THEORETICAL FRAMEWORK

The following sections present the frameworks and definitions related to perceived risk and information search proposed and used in this research.

A. Perceived Risk:

This study used perceived risk concepts from the Bettman (1973), and Dowling and Staelin (1994) frameworks, proposing that there are three different components of risk that make up Overall Perceived Risk (OPR). A glossary of terms is provided in Table 2.1.

Overall Perceived Risk (OPR): This is defined as the person's overall perception of the riskiness associated with buying a product for a particular situation.

Product Category Risk (PCR): When the consumer has no brand information, Overall Perceived Risk (OPR) reflects the person's perception of risk inherent in purchasing any particular brand in a specific product class and is analogous to Bettman's (1973) concept of inherent risk. For example, a person may perceive the purchase of OTC cold products as not inherently risky due to the over-the-counter nature of the product, while another may perceive such a purchase to be risky because OTC cold products are still a type of a medication. This particular component is called a person's Product Category Risk (PCR) and it is assumed that a person with a higher PCR will perceive a given situation to be more risky than a person with a lower PCR. For example, OTC anti-ulcers are considered as more risky than OTC cold products.

Table 2.1: Glossary of terms

Term	Acronym	Explanation
Overall Perceived Risk	OPR	- A person's overall perception of the riskiness associated with purchasing a product for a particular situation.
Product Category Risk	PCR	- A component of Overall Perceived Risk that is inherent in purchasing any brand in a product class. - Analogous to inherent risk.
Product Specific Risk	PSR	- A component of Overall Perceived Risk associated with product characteristics of a particular brand in a product class. - Also a component of handled risk.
Situation Specific Risk	SSR	- A component of Overall Perceived Risk associated with the characteristics or needs of the person or situation for which the brand is purchased. - Also a component of handled risk
	OPR_1	- A person's overall perception of the riskiness associated with using any brand in a product class, e.g., OTC cold products in general. $OPR_1 = \{PCR\}$
	OPR_2	- A person's overall perception of the riskiness associated with using a specific brand in a product class, e.g., an OTC cold product called Cold-Arrest. $OPR_2 = \{PCR, PSR\}$
	OPR_3	- A person's overall perception of the riskiness associated with using a brand in a product class when the consumer has specific characteristics or needs, e.g., a person with a past health problem using Cold-Arrest. $OPR_3 = \{PCR, PSR, SSR\}$

Product Specific Risk (PSR): Handled risk conceived as inherent risk modified by information, becomes a component of Overall Perceived Risk (OPR) in addition to inherent risk once the consumer obtains brand information (Bettman, 1973; Dowling and Staelin, 1994). This type of risk is associated with the product characteristics of a particular brand being considered in the product class and is called Product Specific Risk (PSR). Some brands may be perceived as safer than others in the same product class. For example, Products A has fewer side effects than Product B therefore it is considered to be of lower risk than Product B even though they belong to the same product class.

Situation Specific Risk (SSR): Another type of perceived risk is associated with the characteristics or needs of the person or situation for which the brand is purchased. It may be more risky for people with certain characteristics to use a specific brand. For example, it may be considered as more risky for hypertensive patients to take OTC decongestants than for those without high blood pressure. Additionally, some purchasing situations may be considered safe while others may be perceived as risky. For example, buying an OTC cold product for a child may be considered as more risky than buying a product for an adult. This component is called Situation Specific Risk (SSR).

Situational Specific Risk is not explicitly presented as another type of perceived risk in both Bettman's (1973) and Dowling and Staelin's (1994) models of perceived risk. However, embedded in Bettman's handled risk and Dowling and Staelin's antecedents for overall perceived risk (e.g., purchase goals, intended usage, involvement) are situational needs. Furthermore, Charupatanapong (with Rascati, 1991; 1996) studied consumers' risk perceptions of self-medication practices and OTC medications in various situations.

In summary, without brand information, personal characteristics or needs, the consumer's Overall Perceived Risk (OPR_1) consists of only Product Category Risk (PCR) and is analogous to inherent risk.

$$OPR_1 = \{PCR\}$$

When the consumer obtains information about a specific brand in a product class, Product Specific Risk (PSR) becomes another important component in Overall Perceived Risk (OPR_2) in addition to Product Category Risk.

$$OPR_2 = \{PCR, PSR\}$$

Additionally, Product Category Risk (PCR), Product Specific Risk (PSR) and Situational Specific Risk (SSR) could be concurrently acting upon Overall Perceived Risk (OPR_3) when the consumer is exposed to brand information and situational factors, and is considering using the brand for a specific situation or need. Therefore, Product Specific Risk and Situational Specific Risk are components of handled risk.

$$OPR_3 = \{PCR, PSR, SSR\}$$

While this perceived risk model proposed that there are three main components of risk, it does not posit the way those components should be combined to form Overall Perceived Risk, i.e., whether they have an additive or multiplicative relationship. It is beyond the scope of this research to explore the relationship between the three components.

B. Information Search and Sources:

Information acquisition was chosen as the risk-reducing strategy to be studied. High levels of Overall Perceived Risk can be reduced through extrinsic information search. Consistent with previous marketing studies, the primary research emphasis was on reducing

the uncertainty component of perceived risk. Reducing perceived risk through its adverse consequence component was indirectly addressed by comparing the sources chosen to obtain additional information. The more important the loss or amount at stake, the more "expert" (as perceived by the consumer) source used, e.g., a physician rather than a pharmacist.

This research focuses only on external sources of information. Adapted from the typology of information sources used in previous literature (e.g., Andreason, 1968; Boatman and Gagnon, 1977; Strutton and Lumpkin, 1992), four different categories were proposed based on two characteristics.

The first is level of expertise or objective knowledge. Health care professionals have a higher level of expertise than lay persons. OTC package label and reference books are also considered as expert sources due to FDA's OTC labeling requirements that stipulate objective and accurate information on the packaging, and the high level of knowledge from a number of different expert sources needed to put together a reference book. Advertising media (e.g., television, radio or print ad) is considered as non-expert sources because selective pieces of information are usually emphasized and presented to best promote the OTC drug products.

The second characteristic is the channel of communication. An exchange between two or more people is called "interpersonal" while one that involves an inanimate object (e.g., reference book, OTC package label, advertisements) that cannot respond back is called "impersonal."

Therefore, the following four categories were used in this research: "expert interpersonal" (e.g., pharmacists and physicians), "expert impersonal" (e.g., reference book), "non-expert interpersonal" (e.g., family and friends) and "non-expert impersonal" (e.g.,

advertising media) sources. The higher the level of Overall Perceived Risk, the more expert interpersonal sources of information will the consumer seek and prefer to use. See Figure 2.1 for the proposed conceptual model of overall perceived risk and extrinsic information search used in this study.

STUDY OBJECTIVES

The objective of the study was to present a conceptual model of overall perceived risk and information search. Overall Perceived Risk (OPR) was proposed to compose of three different components: Product Category Risk (PCR), Product Specific Risk (PSR) and Situation Specific Risk (SSR). The next objective was to study the effects of overall perceived risk on consumer's extrinsic information search and choice of information source. It was hypothesized that consumers with higher overall perceived risk would search more for additional information and prefer expert interpersonal sources of information.

RESEARCH QUESTIONS AND HYPOTHESES

1. To study the effects of consumers' overall perceived risk on information search.

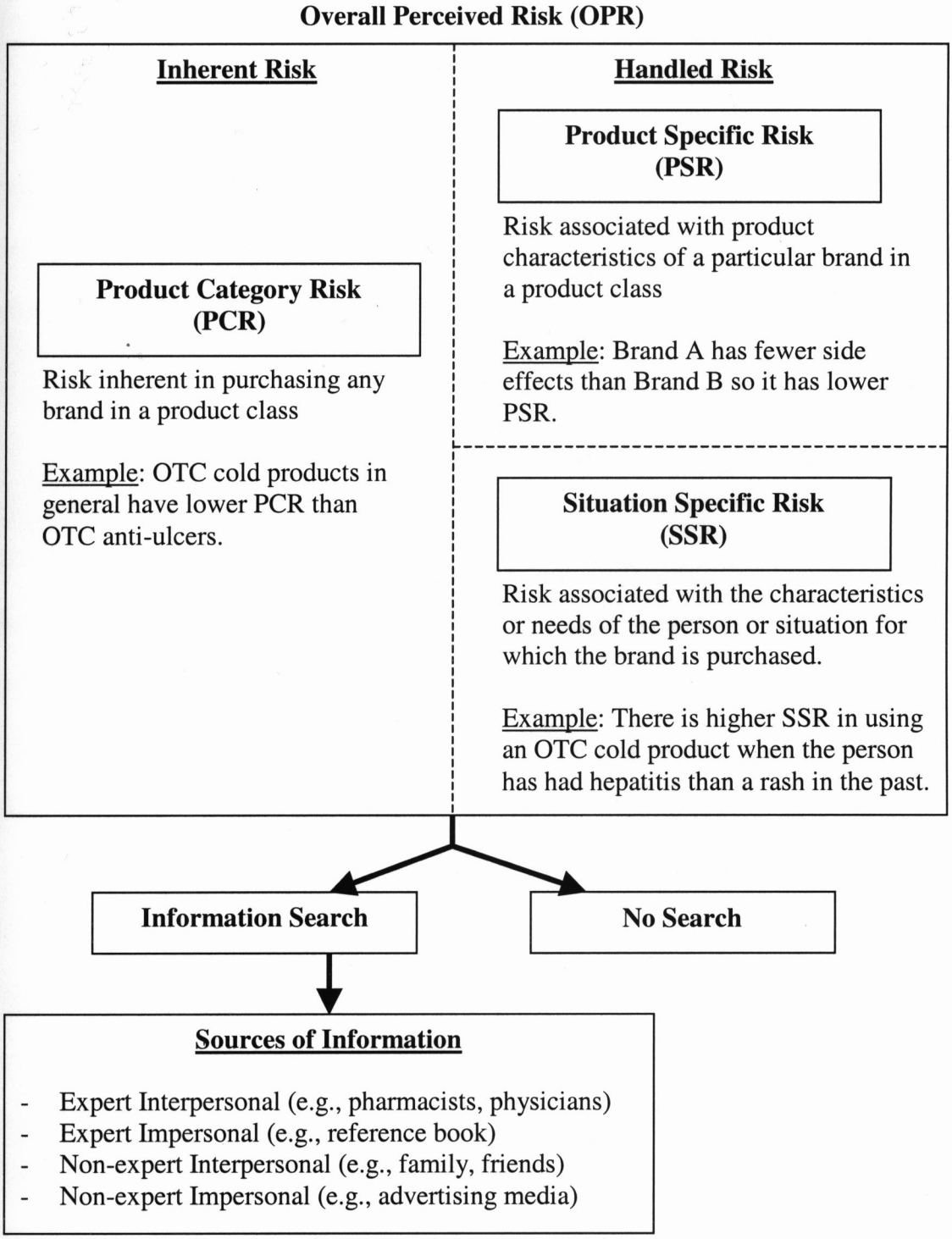
   H1: Consumers with higher overall perceived risk search for more information.

2. To study the effects of consumers' overall perceived risk on different sources of information.

   H2: Consumers with higher overall perceived risk seek more expert interpersonal sources (e.g., physician or pharmacist) as a source of information.

   H3: Consumers with higher overall perceived risk prefer to use more expert interpersonal sources (e.g., physician or pharmacist) as a source of information.

Figure 2.1: Proposed model of perceived risk and information search (adapted from Bettman, 1973; Dowling & Staelin, 1994)



CHAPTER 3

METHODS

In this chapter, the rationale for the study design will first be described followed by details of the research design. Then, the development of independent and dependent measures used will be discussed. A brief description of the questionnaire format will then be given followed by details of the pilot study used to pretest the instrument. Finally, data collection procedures used in the study and plan for data analysis will be explained.

STUDY DESIGN RATIONALE

Decision to focus on OTC products: This study chose to focus on perceived risk of OTC drugs rather than on prescription drugs for four reasons. First, OTC products have been studied less in terms of consumers' risk perceptions of them. Pharmacy researchers have tended to focus on consumers' risk perceptions of prescription medications (e.g., Kare et al. 1996; Slovic et al., 1991). Second, there is a trend toward greater OTC use accompanied by the belief that they are safer than prescription drugs (Soller, 1998).

Third, in 1997, the FDA proposed labeling rules for OTC drugs that would make information on the label easier to read and understand, and standardized so that consumers could compare products to decide which was best for the symptoms they wished to treat (Federal Register, 1997). Seeing an opportunity to experiment with FDA's 1997 prototype, this study followed the proposed OTC package label requirements to present information as distinct elements in an uncluttered format to increase the reliability of product information manipulation and decrease respondents' confusion and reading burden. Fourth, there is an

opportunity for pharmacists to find a niche advising patients about OTC medications. Therefore, this study presented an opportunity to study whether people might use pharmacists for OTC drug use consultation.

Decision to focus on safety risk: Jacoby and Kaplan (1972) proposed that overall perceived risk is comprised of five dimensions: performance, financial, physical, social and psychological. Due to the non-health related nature of most consumer products available, marketing research has focused more on other types of risks than on safety or physical risk, e.g., Lutz and Reilly (1974) studied the effects of perceived social and performance risks on information acquisition. For self-medication use, pharmacy studies (e.g., Charupatanapong, 1994) found that safety and performance risks were the two most influential risk factors in consumers' decision to practice self-medication.

According to the federal OTC regulations in 21 CFR 330.10 (a) (4), safety means "a low incidence of adverse reactions or significant side effects under adequate directions for use and warnings against unsafe use as well as low potential for harm which may result from abuse under conditions of widespread availability." For an OTC product, there can be many types of safety risks, e.g., the severity and number of side effects, contraindications and drug interactions with other prescription drugs that the person may be taking, the probability of side effects occurring. Therefore, the need to understand OTC safety risk perceptions is more relevant now than ever due to the number of recent switches of drugs from prescription to OTC status and the salience of side effects to consumers related to their drug products (Hoy, 1994).

Choice of an OTC drug category: Several different criteria were used in selecting the product category of cold medications for the study. First, the product category has to be one

which consumers use. According to literature, cough/cold products and analgesics were the two product categories most often used by consumers (Suveges, 1992). Because there are too many variables (e.g., brand names, indications for health conditions, active ingredients, etc) associated with analgesics, it would be more difficult to study them than cough/cold products.

Second, pharmacy literature looked at pharmacist consultation related to OTC products and found that people were more likely to ask pharmacists about cough/cold products over analgesics. Cosler et al. (1986) conducted a study of consumer preference for personal drug information source and found that the majority of the respondents would seek information from a pharmacist on drugs of moderate to low importance. Cough/cold products, antidiarrheals and laxatives were categorized as of moderate to low importance and were the drug categories that consumers asked the pharmacist about most. Consumers categorized analgesics as having high importance and were more likely to ask a physician about them (Cosler et al., 1986).

Finally, this researcher was interested in studying OTC risk perceptions of a younger, student population who may have more experience or familiarity with using cough/cold products than analgesics or antidiarrheals.

Decision to use a hypothetical drug: The researcher chose a hypothetical drug in order to control for all the factors that could feed into use of an existing OTC product (e.g., prior experience, identification with a brand name, confusion over the similarities between side effects, labeling information and brand names between two different drugs). Also, with a hypothetical drug, it is easier to tailor and manipulate product information and purchasing situations.

In addition, pharmacy students were to be included in the sample. A pilot study conducted by the researcher found that pharmacists and pharmacy students were too involved in and familiar with a real drug product. Instead of using the information provided for it in the scenario, they would attribute a side effect and risk perception of the product based on their personal experience, drug knowledge and recognition of the brand name or active ingredient. Therefore, a hypothetical cold product called Cold-Arrest was chosen to use in the study.

Decision to use an experimental design: The researcher was interested in testing the effects of handled risk on information search. Therefore, the decision to use an experimental design rather than naturalistic observation for the study was made for better control over the manipulations of the different types and levels of perceived risk.

Decision to use a student sample: In the pilot study conducted to pretest the original instrument, responses were found to be significantly different between the samples of ten younger undergraduate students, and ten older graduate students and non-students (e.g., faculty and university staff). Personal experience and past medication use were key factors influencing both the definitions and perceptions of risk for the older non-student subjects. Additionally, as a graduate student, the researcher had greater and easier access to the student population. Therefore, a decision to use only students was made for the final study.

STUDY DESIGN

The cross-sectional exploratory study implemented a completely randomized experimental 2 x 2 factorial design to test the effects of handled risk, specifically the components of Product Specific Risk (PSR) and Situational Specific Risk (SSR) in Overall Perceived Risk (OPR), on consumers' information search. The following section first reiterates the most important characteristics of the study's proposed concept of overall perceived risk and its three components. Then, it describes the different treatments and levels of manipulations used to vary the components of overall perceived risk in the study, and how they were incorporated into the study design.

Overall Perceived Risk (OPR) was operationalized as a combination of Product Category Risk (PCR), Product Specific Risk (PSR) and Situational Specific Risk (SSR). Without personal needs or product brand information, Overall Perceived Risk (OPR_1) consists of only Product Category Risk, e.g., the risk of using OTC cold products in general.

$$OPR_1 = \{PCR\}$$

When the respondent is given information for a specific product brand, Product Specific Risk in combination with Product Category Risk makes up the Overall Perceived Risk of using that particular product (OPR_2), e.g., the risk of using a specific cold OTC product after reading its package label.

$$OPR_2 = \{PCR, PSR\}$$

If there is a specific need with product brand information, the Overall Perceived Risk of using a particular product in a particular situation (OPR_3) consists of Situational Specific Risk in addition to the other two types of risk mentioned earlier, e.g. the risk of using a specific cold

product when the person has a history of a specific health problem.

$$OPR_3 = \{PCR, PSR, SSR\}$$

An experimental 2 x 2 factorial design was employed to test the effects of two levels of Product Specific Risk and two levels of Situational Specific Risk on information search. Product Specific Risk (PSR) is the risk associated with the product characteristics of a particular brand in a product class. Side effect was chosen as the product characteristic to vary Product Specific Risk. Therefore, to study its effects on information search, two labels for a hypothetical OTC cold product called Cold-Arrest varying on the number of side effects listed (two versus four) were created. Terminology and format of the labels were consistent with those of FDA's (1997) prototype. See Appendix A for the two Cold-Arrest labels used in the study.

Situation Specific Risk (SSR) is the risk associated with the characteristics or needs of the person or situation for which the brand is purchased. Past health problem was chosen as the characteristic of the person using the product to vary Situational Specific Risk. Therefore, to test the effects of Situational Specific Risk on information search, two scenarios (rash and hepatitis) were used to manipulate the levels of perceived risk. The scenarios were chosen and adapted based on pharmacy literature that studied risk perceptions of prescription drugs or self-medication practices in various types of situations (e.g., Wiederholt, Schommer and Brushwood, 1992; Charupatanapong and Rascati, 1991). The levels of perceived risk in the scenarios were pretested in a pilot study in which twenty respondents were asked to rank them in order of risk. See Appendix B for the description of the two scenarios used in the study.

The 2 x 2 factorial design experiment, therefore, consisted of two different treatments testing the effects of Product Specific Risk and Situation Specific Risk.

Treatment A: The *number of side effects* of the OTC product according to the label. This treatment looks at the effects of Product Specific Risk on information search. It consists of two levels of side effects: A_1 is two side effects (drowsiness and excitability) and A_2 is four side effects (drowsiness, liver damage, nausea & vomiting, and diarrhea). The condition of the side effects also included a precaution on liver disease for both labels.

Treatment B: The *seriousness of past health problem* affecting risk of using the OTC product *with risk information for that type of health problem on the label.* This treatment tests Situation Specific Risk by varying the levels of seriousness associated with a *past* health problem. It consists of two levels of seriousness: B_1 is low seriousness (red rash developed after using a friend's OTC drug) and B_2 is high seriousness (past hospitalization due to hepatitis). Risk information on both Cold-Arrest labels with two and four side effects warned that the person should ask a doctor or a pharmacist before using the OTC product if s/he has "liver disease" and to stop using the product and ask a doctor or pharmacist right away if s/he is "allergic to the product and has hives, redness, swelling or breathing problems." Refer to Table 3.1 for a summary of the treatment descriptions and combinations.

Table 3.1: Treatment combinations and descriptions

	Low PSR	High PSR
Low SSR	A_1B_1 (2 SE; rash scenario)	A_2B_1 (4 SE; rash scenario)
High SSR	A_1B_2 (2 SE; hepatitis scenario)	A_2B_2 (4 SE; hepatitis scenario)

PSR = Product Specific Risk; SSR = Situation Specific Risk
SE = side effects

To test the effect of Treatment A on Overall Perceived Risk of Cold-Arrest (OPR_2), a completely randomized (CR-A) design was used with half of the respondents getting the label with two side effects and the other half the label with four side effects. To test the effects of Treatments A and B on Overall Perceived Risk of using Cold-Arrest in the situation of having a past health problem (OPR_3), a completely randomized factorial (CRF-AB) design was used with a quarter of the respondents getting a label with two side effects and a rash scenario, a label with four side effects and a rash scenario, a label with two side effects and a hepatitis scenario, or a label with four side effects and a hepatitis scenario.

MEASURE DEVELOPMENT

This study was designed to measure the influence of several independent variables on two dependent variables, search for information and source of information. The independent variables and measures were selected and adapted from several business and pharmacy related studies identified from the perceived risk literature. Unfortunately very few researchers have examined the internal reliability of their measures of perceived risk (Dowling, 1986). The following section first discusses measurement problems in past risk literature, and how the perceived risk measure was created and modified accordingly for this study. Then, the independent and dependent measures used in the study will be presented.

The concept of perceived risk most often adopted by marketing researchers defines perceived risk as a function of two components: uncertainty and consequences. Several problems have been identified in the measurement of perceived risk in terms of these two dimensions in the marketing discipline (Dowling, 1986; Stone and Gronhaug, 1993; Mitchell, 1999).

First, it is generally assumed that the two risk components, uncertainty and consequences, have a multiplicative relationship. However, when linear and multiplicative models of perceived risk were actually tested, little difference in terms of degree of fit was found (Bettman, 1975). Additionally, both consequences and certainty are equally weighted (Dowling, 1985). However, the consequence component may be weighed more heavily by consumers when perceiving risk in different product classes.

The different types of consequences in the overall perceived risk construct are also given the same level of importance when certain risk aspects will be more prevalent in some purchase situations than in others (Stone, 1993). These dimensions are also treated as being independent when they could actually be related (Mitchell, 1999). Furthermore, multiple measures for each risk component and type of adverse consequence are lacking in the marketing literature (Stone and Gronhaug, 1993).

Another pertinent issue regarding the measurement of perceived risk in marketing is the assumption that consumers know what to expect from a product and face uncertainty with respect to only negative consequences (Stone, 1993; Mitchell, 1999). In Mitchell's (1999) review of the literature on consumer-perceived risk over the past 30 years, he noted that marketing researchers have tended to study more on low-cost, low-involvement, simpler convenience products with which consumers are reasonably familiar, thereby focusing on routinized purchase behavior which does not involve extensive problem solving.

In the area of pharmacy, the perceived risk construct has not been applied very extensively to nonprescription drugs. Past pharmacy research on risk perceptions of OTCs (e.g., Charupatanapong and Rascati, 1991; Charupatanapong, 1994; Strutton et al., 1992)

have tended to follow the marketing model of perceived risk, thereby sharing many of the same measurement problems of the perceived risk construct.

This research attempted to address some of the measurement issues concerning the operationalization of perceived risk in the following ways. First, while acknowledging that perceived risk is a multidimensional construct composed of uncertainty and consequences, it was decided to instead use a global measure of overall perceived risk in this study. This was done to avoid the problems of whether the risk dimensions of uncertainty and consequences should be combined in a linear or multiplicative model, and whether each risk dimension should be weighted equally and considered as independent. Second, multiple measures were created for overall perceived risk.

Finally, one issue that affects the reliability of perceived risk measures is whether or not researchers have briefed their subjects about the concept of risk to standardize their understanding of it (Dowling, 1986). To clarify the nature of perceived risk used in the study and to prevent subjects from defining it in a variety of ways, "risk" was defined in the instructions of the questionnaire as "exposure to the possible harmful effects of using an OTC cold product." Additionally, an "OTC cold product" was defined as "a drug product that you can buy without a prescription and is used to treat common cold symptoms such as a fever, a running nose and nasal congestion." The final independent and dependent measures will now be described.

A. Independent Variables:

1. Perceived Risk Measures:

A multi-item overall perceived risk measure of three items (RISK, SAFE, COMF) was created for this study and adapted from several sources (Bettman, 1975; Morris, Brinberg, Kilmberg, Millstein and Rivera, 1986). It asks subjects to rate the riskiness, safety and comfort level in using an OTC product on a seven-point semantic differential scale. This three-item measure was used to study overall perceived risk when Product Category Risk and Product Specific Risk are present. A different multidimensional measure consisting of three items was developed to study Situational Specific Risk, but only the item (RISK3) measuring the riskiness dimension will be studied here to enable comparison with the same item in the measures discussed previously. See Table 3.2 for the perceived risk measures.

2. Demographic and Health Related Measures:

In addition to risk related independent variables operationalized through the different labels and scenarios, several demographic and health related variables were collected. According to a study by Lively et al. (1981) on the relationship between knowledge and perceived benefits and risks of oral contraceptives, users of oral contraceptives had significantly higher perceived benefit and lower perceived risk than did nonusers.

Schiffman (1972) found an inverse relationship between new product trial and perceived risk for elderly consumers. Additionally, Charupatanapong (1994) found that respondents who were female, married, older, and highly educated had higher perceived risk for self-medication practices than those who were male, single, younger, and less educated.

Table 3.2: Items used to measure overall perceived risk

Variable	Item description
	Overall Perceived Risk of OTC cold products in general (OPR_1)
RISK1 [a]	How **risky** do you think it would be for you to take OTC cold products? [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]
SAFE1	How **safe** do you think OTC cold products are? (reverse coded) [Not safe at all] 1 2 3 4 5 6 7 [Extremely safe]
COMF1	How **comfortable** are you about taking OTC cold products? (reverse coded) [Not at all comfortable] 1 2 3 4 5 6 7 [Extremely comfortable]
	Overall Perceived Risk of Cold-Arrest (OPR_2)
RISK2 [a]	How **risky** do you think it would be for you to take Cold Arrest? [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]
SAFE2	How **safe** do you think Cold Arrest is? (reverse coded) [Not safe at all] 1 2 3 4 5 6 7 [Extremely safe]
COMF2	How **comfortable** are you about taking Cold Arrest? (reverse coded) [Not at all comfortable] 1 2 3 4 5 6 7 [Extremely comfortable]
	Overall Perceived Risk of using Cold-Arrest with a past health problem (OPR_3)
RISK3 [a]	How **risky** do you think it would be for you to take Cold Arrest? [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]
PROBAB3 [b]	How **likely** do you think it is that you would get a **rash** from **Cold-Arrest** ? [Not likely at all] 1 2 3 4 5 6 7 [Extremely likely]
SERIOUS3 [b]	If you get a **rash** from Cold-Arrest, how **serious** do you think it would be for you? OR If you get **liver damage** from Cold-Arrest, how **serious** do you think it would be for you? [Not serious at all] 1 2 3 4 5 6 7 [Extremely serious]

[a] Same item used consistently across different types of overall perceived risk.
[b] Item was not analyzed in this study.

Those who had experienced past health problems also perceived a higher risk perception than those who had not. Kare et al. (1996) found that the demographic variables were partially related to perceived risk. Financial risk was significantly related to gender for all drug categories except antihypertensives, with women ranking higher. Women also perceived a higher level of risk (overall, safety and performance) with sedatives and hypnotics. The more educated consumer perceived a higher level of risk for financial and performance with antihypertensives and greater performance and overall risk with sedatives (Kare et al., 1996).

Additionally, research (e.g., APhA, 1997; Portner and Smith, 1994) has found age and current use of prescription medications to be related to the type of information source for OTCs. Thus, based on the results of previous research studying important correlates of perceived risk and type of information source, several demographic and health related variables were chosen and adapted from existing standard measures.

The demographic and health related variables included in the study are described below. In parentheses are the names used to identify the variables.

2a. Demographic variables:

1. *Age* (AGE)
2. *Gender* (SEX)
3. *Health care experience* (H_EXP): Respondents were asked whether they currently have or had in the past, education, work or background in a health care field.

2b. Health related variables:

1. *Prior use of OTC cold products* (OTC_USE)
2. *Frequency of OTC cold product usage in past six months* (FREQ_USE)

3. *Place where OTC cold products are most often bought* (PLACE): a chain, mass merchandise, HMO pharmacy, independent pharmacy or a grocery store.
4. *Prior use of an OTC cold product similar to Cold-Arrest* (COLD_USE)
5. *Prior use in the past one month of any OTC product other than for a cold* (OTHER_OTC)
6. *Prior experience of an adverse reaction from taking another OTC cold product* (OTC_EXP3): Respondents were asked whether they had ever experienced a rash or liver damage from taking another OTC cold product.
7. *Self-rated knowledge about the proper use of OTC cold products in general* (KNOW)
8. *Self-reported health status* (HSTATUS)
9. *Pre-existing health problems* (HPROBLM)

More variables were collected but will not be discussed here because they were not included in the study analyses. The description of each demographic or health related variable used in the study is presented in Table 3.3.

B. Dependent Variables:

1. Information Search Measures:

The first dependent variable in this study was the search for more information. A dichotomous measure was used to identify whether or not the respondents would look for more information beyond the given OTC label. This item was used across each of the three types of Overall Perceived Risk. See Table 3.4 for the measures.

Table 3.3: Demographic and health related items

Variable	Item description
OTC_USE	Have you ever used an OTC cold product before? ☐ No ☐ Yes
FREQ_USE	If yes, how often have you used an OTC cold product in the past **six** months? ☐ 0 times ☐ 1- 2 times ☐ 3-4 times ☐ 5-6 times ☐ ≥ 7 times
PLACE	Where do you usually buy an OTC cold product? Please **rank** the top **three** places in order of frequency (1 = 1st most often, 2 = 2nd most often, 3 = 3rd most often). ___ Grocery store (e.g. Sentry, Kohl's, Woodman's) ___ Independent community pharmacy (e.g., Mallat, Neuhauser) ___ Chain community pharmacy (e.g. Walgreen) ___ Mass merchandise (e.g. Walmart, ShopKo) ___ HMO pharmacy (e.g. Dean, Physician Plus) ___ Other, specify _____
KNOW	How **knowledgeable** do you think you are about the proper use of OTC cold products? [Not at all knowledgeable] 1 2 3 4 5 6 7 [Extremely knowledgeable]
COLD_USE	Have you ever used an OTC cold product similar to **Cold-Arrest**? ☐ No ☐ Yes
OTC_EXP3	Have you ever experienced a **rash** from taking an **OTC cold product**? OR Have you ever suffered **liver damage** from taking an **OTC cold product**? ☐ No ☐ Yes
AGE	Your age is: _____ years
SEX	Your gender is: ☐ Male ☐ Female
H_EXP	Which of the following health care related experiences do you have? Please check **all** that is applicable to you. ☐ I am not currently studying for a degree, do not have a degree, or am not working in a health care related field. ☐ I am currently studying or already have a degree in a health care related field. Please specify field _____ ☐ I am working or I have worked in a health care related field. Please specify the type of work _____ and field _____
HSTATUS	In your opinion, how would you rate your own health? ☐ Poor ☐ Fair ☐ Good ☐ Very Good ☐ Excellent
HPROBLM	Do you have any health problem(s)? ☐ No ☐ Yes
OTHER_OTC	In the past **one** month, have you taken any OTC drug products **other than for a cold**? ☐ No ☐ Yes

Table 3.4: Items used to measure information search

Variable	Item Description
SEARCH1	Information search for OTC cold products in general Other than reading the drug package label, would you look for more information (e.g., ask another person) before buying a new OTC cold product that you've never used before? "No, I would not look for more information because _____" "Yes, I would look for more information because _____"
SEARCH2	Information search for Cold-Arrest Other than reading Label A, would you look for more information (e.g., ask another person) before using Cold-Arrest? "No, I would not look for more information because _____" "Yes, I would look for more information because _____"
SEARCH3	Information search for using Cold-Arrest with a past health problem Other than reading Label A, would you look for more information (for example, consult another person) before taking Cold-Arrest? "No, I would not look for more information because _____" "Yes, I would look for more information because _____"

2. Sources of Information Measures:

The source of information was the second dependent variable and was adapted from the major categories of information sources proposed by Andreason (1968) and used by Boatman and Gagnon (1977), and Strutton and Lumpkin (1992). The question: "Which source of information would you use/prefer?" was developed to determine which information sources for OTC drugs would be used by and preferred by the respondents. In this study, it was obtained from the respondents who had answered "Yes, I would look for more information" for the primary dependent variable and included the following seven different sources: family member, physician, reference book, friend, pharmacist, advertising media, and other. The item was used across the perceived risks for general OTC cold products, Cold-Arrest and specific scenarios.

Additionally for OTC cold products, the respondents were asked to rank order eight information sources for influencing information search in terms of frequency, accessibility and trust: OTC drug label, family member, physician, reference book, friend, pharmacist, advertising media, and other. However, for the purpose of this study, only results pertaining to information sources most often used and preferred will be reported for general cold OTCs. See Table 3.5 for items used to determine information sources used and preferred by respondents.

Table 3.5: Items used to determine intended and preferred information sources

Variable	Item description
USE1	Information sources for cold OTCs in general Which source of information do you use most **often** for an OTC cold product? Please **rank** the top **three** sources of information in order of frequency (1 = 1st most often, 2 = 2nd most often, 3 = 3rd most often). ___ OTC package label ___ Friend ___ Family member ___ Pharmacist ___ Physician ___ Advertising media (e.g. TV, radio, print ad) ___ Reference book ___ Other, specify _____
PREFER1	Which source of information would you **prefer** to use? Please **rank** the top **three** sources of information in order of preference (1 = 1st most preferred, 2 = 2nd most preferred, 3 = 3rd most preferred). ___ OTC package label ___ Friend ___ Family member ___ Pharmacist ___ Physician ___ Advertising media (e.g. TV, radio, print ad) ___ Reference book ___ Other, specify _____
USE2	Information sources for Cold-Arrest (2 vs. 4 side effects) [Other than reading **Label A**, would you look for more information (e.g. ask another person) before taking **Cold-Arrest**?] **If yes**, which source of information would you use? Please check only **one**. ___ Family member ___ Advertising media (e.g. TV, radio, print ad) ___ Reference book ___ Pharmacist ___ Physician ___ Friend ___ Other, specify _____
PREFER2	**If yes**, which source of information would you **prefer** to use? Please pick **one** from the list above and give the reason why you would prefer that source for information. Source: _____ Reason: _____
USE3	Information sources for Cold-Arrest (2 vs. 4 side effects) [Other than reading **Label A**, would you look for more information (e.g. ask another person) before taking **Cold-Arrest**?] **If yes**, which source of information would you use? Please check only **one**. ___ Family member ___ Advertising media (e.g. TV, radio, print ad) ___ Reference book ___ Pharmacist ___ Physician ___ Friend ___ Other, specify _____
PREFER3	**If yes**, which source of information would you **prefer** to use? Please pick **one** from the list above and give the reason why you would prefer that source for information. Source: _____ Reason: _____

QUESTIONNAIRE FORMAT

The final questionnaire consisted of seven different sections in addition to the cover letter and a page of instructions. Only those sections relevant to this study will be described briefly here. Please see Appendices C and D for the questionnaire and its code book respectively. Questionnaire items are also provided in Tables 3.2, 3.3, 3.4 and 3.5.

In the instructions, the definitions of both "OTC cold product" and "risk" were given. An "OTC cold product" was defined as a "drug product that you can buy without a prescription and is used to treat common cold symptoms such as a fever, a running nose and nasal congestion." "Risk" was defined as "exposure to the possible harmful effects of using an OTC cold product."

The first section of the questionnaire consisted of questions that dealt with OTC cold products in general. Respondents were asked to rate a three-item measure of overall perceived risk for OTC cold products. Additionally, they indicated whether they would look for more information in addition to reading the OTC package label before buying a new OTC cold product that they had never used before. They were also to indicate the source of information used most often and preferred. They were also asked if they had ever used an OTC cold product before, and how knowledgeable they think they were about the proper use of OTC cold products.

The second section of the questionnaire consisted of the same measures as were used in the first section with respect to risk (three-item measure), information search and information source intended and preferred. However, the second section consisted of questions that dealt with a specific cold product rather than OTC cold products in general. Attached at the back of the questionnaire was a drug package label called "Label A" with

either two or four side effects listed on it for a hypothetical OTC cold product called Cold-Arrest. Respondents were instructed to assume that this was the first day that they had come down with a slight fever and had a runny and stuffy nose, and that they had decided to buy Cold-Arrest to self-treat their cold. See Appendix A for the descriptions of the two labels. An additional question not included in the first section was whether the person had ever used an OTC cold product similar to Cold-Arrest.

In the third section, respondents were instructed to answer the questions in the context of a given scenario. Respondents read a scenario that they had come down with a cold, and had a slight fever and a runny and stuffy nose. They were to think that the cold would go away on its own soon but since they disliked not being able to breathe easily through their nose, they decided to buy Cold-Arrest to treat their cold symptoms. However, they had a past health problem of either a red rash on their face due to using their friend's OTC cold medicine or a hospitalization due to hepatitis. See Appendix B for the descriptions of the scenarios.

A global single item of perceived risk was given that was part of the three-item measure used in the previous two sections. The same information search and source measures as those in the second section were also included. Additionally, not included in the previous sections, a question asked whether respondents had experienced either a rash or liver damage from taking an OTC cold product before.

In the final section, demographic and health related information was collected. See Table 3.3 for the list of variables. Figure 3.1 provides a summary of study and questionnaire design.

Figure 3.1: Summary of study and questionnaire design

Manipulation to test Product Specific Risk (PSR) and Situation Specific Risk (SSR) on information search

- 2 treatment levels of PSR by varying the number of side effects on Cold-Arrest label (2 vs. 4)
- 2 treatment levels of SSR by varying the severity of a past health problem (rash vs. hepatitis)
- 4 questionnaire variations based on the number of treatment combinations

Every subject was given one label (2 or 4 side effects), and one past health problem scenario (rash or hepatitis).

- Each subject rated Overall Perceived Risk (OPR) for the following:
  (a) OPR_1 for cold OTCs in general = {PCR}
  (b) OPR_2 for Cold-Arrest = {PCR, PSR}
  (c) OPR_3 for Cold-Arrest used in a scenario = {PCR, PSR, SSR}

- Each subject indicated whether search for more information after reading the label for the following:
  (a) Cold OTCs in general
  (b) Cold-Arrest
  (c) Cold-Arrest used in a past health problem scenario

PILOT STUDY

A pilot study was administered to twenty subjects to pretest the instrument, assess its difficulty and the subject's understanding and interest level, and to estimate the time it would take to complete the questionnaire. The subjects consisted of ten university undergraduates (pharmacy and non-pharmacy), and ten graduate students, faculty and university staff members (pharmacists and non-pharmacists). The decision to test the instrument on both students and non-students, pharmacists and non-pharmacists, and pharmacy and non-pharmacy students was made to determine the salient characteristics for the sample to be drawn for the actual study, and to see whether there was any difference between the responses of these different groups.

Each subject was asked to complete a questionnaire, read two OTC drug labels and rank six hypothetical scenarios in order of highest to lowest risk to check for understanding and differentiation between the levels of perceived risk for each label and scenario. Additionally, each was interviewed on the questionnaire items for 10 to 45 minutes to understand more about how they defined risk and its relevance to them.

The pretest results indicated that the scenarios and labels were perceived in anticipated directions and levels of risk. Age, personal experience, work experience as a pharmacist and medication use of the subjects had some influence on both their definitions and perceptions of risk so the investigators decided to focus only on the students and non-pharmacists. There were no differences between the responses of undergraduates and graduate students unless the graduate student was also a pharmacist. Non-students and pharmacists were taken out of the final study. Pharmacy background did not have much of an effect on the responses between pharmacy and non-pharmacy students unless that

pharmacy student was well into his or her final years of the program. Therefore, a decision was made to include first year pharmacy undergraduate students, and non-pharmacy students, both undergraduate and graduate, in the final sample.

Four different treatments were considered originally to test handled risk in the pilot study. Based on respondents' feedback, however, the fourth treatment of extrinsic factors (studying versus driving) was dropped to control the length of the questionnaire and minimize repetition. Furthermore, the required sample size would have been larger for four treatments. The third treatment (the seriousness of a present health problem) was not analyzed in this study; therefore, it will not be discussed here.

DATA COLLECTION PROCEDURES

The final sample size of 160 was calculated based on twenty people per treatment combination. For the purposes of this study which employed a 2 x 2 factorial design with only two different treatments, each with two levels, there were forty people in each treatment cell. Four different questionnaire variations of the final instrument were administered in this study.

Only university students were chosen to be used in the study; therefore, judgment sampling techniques were used to recruit subjects for the study in accordance with the requirements of the Human Subjects Committee. Data were collected at three different time periods from three groups of University of Wisconsin-Madison undergraduates and graduates in order to reach the sample size of 160 students. Two colleagues and instructors for a summer undergraduate Business course and a fall undergraduate Pharmacy course were contacted if they would be willing to let their students participate in the study. The study

objectives were explained to the students and respondents were asked to volunteer, and those who did not wish to participate did not have to. In order to encourage participation, each respondent was given extra credit for the course. Then a time was scheduled to administer the questionnaires to each group of students in a classroom at the university.

In the actual study, four different questionnaires were systematically randomly assigned to 52 business and 106 pharmacy undergraduate students. The study researcher was responsible for giving all subjects brief instructions on how to complete the instrument, and administering and collecting the questionnaires. The researcher was also not asked any questions by the respondents during the actual data collection. The average completion time was 15-20 minutes.

Out of the 158 questionnaires collected, 150 (94.9%) were usable (51 business and 99 pharmacy). In order to reach the desired sample size of 160, fifteen more students enrolled in the same fall graduate level business course as the study researcher were individually approached and asked to participate in the study. No incentives were given. Due to time constraints, each subject was told to complete the questionnaire in his or her free time after class and to bring it back to the study researcher in the next lecture class. Ten questionnaires were usable.

DATA ANALYSIS

All descriptive and inferential statistics were calculated using the Statistical Package for Social Sciences (SPSS) version 10.0 software package. Frequencies, means and standard deviations were examined for all variables.

Cronbach's alpha was calculated for the three-item perceived risk measures. Item-to-total correlations were then examined for each item. Since each item exhibited correlations exceeding the arbitrarily selected minimum acceptable correlation of 0.30, no item was excluded from future analyses.

Exploratory factor analyses were used to examine the underlying factor structure of the three-item risk measures. Maximum likelihood analyses were used. Since each item exhibited a loading of 0.40 or greater on one factor, no item was deleted. A summed risk score was then calculated by summing the scores on each item in the multi-item measure. Spearman's correlations of the summed risk scores to other variables (i.e., demographic, health related and information search) were then determined because some variables could not be assumed to be at least interval in nature.

Mean comparisons were made for the single risk item that was consistently measured across all different types of products and scenarios (i.e., cold OTCs in general, Cold-Arrest by side effects, and Cold-Arrest by side effects and past health problems). Spearman's correlations of these items to demographic, health related and information search variables were also determined.

To analyze data in a univariate framework, Student's t-test for independent samples was used to determine which differences were statistically significant for relevant variables

measured on an interval or ratio scale. Those variables that could not be assumed to be at least interval in nature were tested using the chi-square test.

Due to the dichotomous nature ('yes/no") of the dependent variable Information Search, logistic regression was utilized as the multivariate data analysis technique. Summary and single item scores of overall perceived risk, as well as demographic and health related variables served as the independent variables in the logistic regression models. The significance of each variable in the model was evaluated using the likelihood ratio test.

CHAPTER 4

RESULTS

This chapter presents the study results. It is divided into two parts. First, the results of the descriptive statistics including preliminary data analyses to examine the reliability and correlations of the multi-item Overall Perceived Risk measures are given. The second part presents the results from the univariate and multivariate analyses used to explore the study's research questions and test hypotheses.

DESCRIPTIVE STATISTICS RESULTS

A. Respondent Demographics:

The study sample consisted of 160 respondents: 99 pharmacy undergraduates, 51 business undergraduates and 10 MBA level graduates. The average age of respondents was twenty two years, and nearly fifty nine percent were female. All had at least a high school education because the sample consisted of university students. Fifty students (31.9%) do not have any health care experience, whether in their study discipline or work experience.

B. Respondent Health Related Characteristics:

About seventy two percent rated their health as very good or excellent, and approximately 76 percent indicated that they do not suffer from any health problems. Almost all (97%) had taken an OTC cold product before. About forty seven percent had used the product(s) one to two times in the past six months. Nearly forty percent (38%) indicated that they usually obtained OTC cold products from chain pharmacies, 34 percent from mass

merchandisers and 21 percent from grocery stores. Eighty percent of the respondents had taken an OTC cold product before similar to the hypothetical drug, Cold-Arrest. Over half (52%) had not taken any OTC products other than for a cold in the past one month. The average self-reported knowledge rating of the proper use of OTC cold products was 4.64 out of a 1-7 rating scale (not at all knowledgeable to extremely knowledgeable). Approximately half (54%) chose a rating over 4. Because the study participants were clearly differentiated by whether or not they have health care experience, i.e., pharmacy and business students, they were separated into two groups by health care experience to see whether they also differ significantly on other characteristics. Table 4.1 shows selected demographics and health related characteristics by health care experience.

Table 4.1: Selected demographics and health related characteristics by health care experience

Variable	Health care exp	No health care exp	All respondents
Average age	22.19 yrs (3.46)	22.48 yrs (4.63)	22.28 yrs (3.85)
Age range	18-40	19-44	18-44
Gender (female)	64%	47%	59%
Health status mean	4.02 (0.74)	3.80 (0.86)	3.95 (0.78)
No health problems	76%	75%	75%
OTC use knowledge mean	4.79 (1.10)	4.33 (1.14)	4.64 (1.13)

Note: Standard deviations are indicated in the parentheses.

The mean score for OTC knowledge was significantly higher for respondents with health care experience when tested using a two tailed student t-test ($p<0.05$). About sixty three percent of those with health care experience chose a rating over 4 for their OTC use knowledge compared to 43 percent of those without experience. The two groups were also significantly different on gender when tested using a Pearson Chi square ($p<0.05$).

Univariate analyses showed that the two groups did not differ significantly in their scores for overall perceived risk of OTC cold products in general and the number of those who would search for additional information after reading the label of cold OTCs in general. Therefore, a decision was made to group them together.

C. Preliminary Data Analysis for Overall Perceived Risk:

Two manipulation checks were performed to test that the levels of overall perceived risk were being varied in the desired direction. Risk mean scores were significantly higher for respondents given the hepatitis scenario respectively when tested using t-tests ($p<0.05$). However, no significant difference was found in the risk mean scores between those who received Cold-Arrest with two side effects and those with four side effects on the label. These results suggested that the two different treatments were successful in manipulating perceived risk in the desired direction. This section will now describe preliminary data analyses used to examine the reliability and correlations of the multi-item Overall Perceived Risk measures.

1. Overall Perceived Risk of OTC cold products: OPR_1 = {PCR}

Scale Reliability: A three-item risk measure (RISK1, SAFE1, COMF1) was used to measure Overall Perceived Risk of OTC cold products in general. See Table 2.1 for the three risk items. Bivariate correlations for all of the risk items were between 0.31 and 0.52. The alpha coefficient for the overall scale was 0.65. Item to total correlations were between 0.37 and 0.51, and the coefficient alpha values with each item deleted were less than the

coefficient alpha for the entire scale except for COMF1 (0.68). Bivariate and item-total correlations are given in Tables 4.2 and 4.3.

Table 4.2: Correlation matrix for items RISK1, SAFE1 and COMF1

Item	RISK1	SAFE1	COMF1
RISK1	1.00	--	--
SAFE1	0.52	1.00	--
COMF1	0.33	0.31	1.00

Table 4.3: Item-total correlations and factor loadings for items RISK1, SAFE1 and COMF1

Item	Mean (S.D.)	Item-total correlation	Alpha if deleted	Factor loadings
RISK1	2.54 (1.06)	0.51	0.47	0.737
SAFE1	2.82 (1.02)	0.50	0.49	0.706
COMF1	2.55 (1.25)	0.37	0.68	0.444

Factor Analysis: Two tests were performed to test whether the data were appropriate for factor analysis. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.62, and Barlett's Test of Sphericity was rejected at $p<0.05$. Both of these results indicated that using factor analysis was appropriate to analyze the data. One factor explaining 41.3 percent of the variance in the measure was extracted, and factor loadings for that factor are given in Table 4.3.

Since the scale was unidimensional, a single summed risk score (SUM_RISK1) was created by adding the scores from all three risk items. The scores ranged from 3 to 15, out of a possible 3 to 21, and had a distribution close to normal with a skewness of 0.39, a mean of

7.91 and a standard deviation of 2.55. If considered individually, the mean score for the single item RISK1 was 2.54 (S.D. = 1.06). Results are reported in Table 4.4.

Table 4.4: Overall perceived risk frequencies and percentages for OTC cold products in general and Cold-Arrest with 2 and 4 side effects

Score	Cold OTCs in general N = 160	Cold-Arrest with 2 side effects N = 80	Cold-Arrest with 4 side effects N = 80
3	5 (3.1%)	2 (2.5%)	1 (1.3%)
4	6 (3.8%)	3 (3.8%)	--
5	13 (8.1%)	1 (1.3%)	5 (6.3%)
6	28 (17.5%)	11 (13.8%)	10 (12.5%)
7	28 (17.5%)	7 (8.8%)	6 (7.5%)
8	19 (11.9%)	7 (8.8%)	7 (8.8%)
9	21 (13.1%)	7 (8.8%)	8 (10.0%)
10	12 (7.5%)	10 (12.5%)	5 (6.3%)
11	11 (6.9%)	7 (8.8%)	6 (7.5%)
12	8 (5.0%)	8 (10.0%)	10 (12.5%)
13	7 (4.4%)	6 (7.5%)	1 (1.3%)
14	1 (0.6%)	3 (3.8%)	5 (6.3%)
15	1 (0.6%)	2 (2.5%)	2 (2.5%)
16	--	2 (2.5%)	4 (5.0%)
17	--	1 (1.3%)	2 (2.5%)
18	--	1 (1.3%)	6 (7.5%)
19	--	1 (1.3%)	1 (1.3%)
20	--	1 (1.3%)	--
21	--	--	1 (1.3%)
SUM_RISK mean (S.D.)	7.91 (2.55)	9.84 (3.70)	10.66 (4.21)
RISK mean (S.D)	2.54 (1.06)	3.15 (1.39)	3.45 (1.55)

Bivariate correlations: Correlations between SUM_RISK1 and various demographic and health related variables were examined in Table 4.5. Nonparametric Spearman's rho correlations were calculated because some of the variables were not interval or ratio. SUM_RISK1 was positively and significantly correlated with gender (SEX) at 0.16. The correlation between SUM_RISK1 and OTC use knowledge (KNOW) was significant and negative at 0.20. Correlations between SUM_RISK1 and the remaining variables were low and insignificant. Correlations between the single item RISK1 and demographic and health related variables are also reported in Table 4.5. RISK1 was positively and significantly correlated with gender (SEX) at 0.21.

2. Overall Perceived Risk of Cold Arrest: OPR_2 = {PCR, PSR}

Scale reliability: A three-item risk measure (RISK2, SAFE2, COMF2) was used to measure Overall Perceived Risk of Cold-Arrest. See Table 2.1 for the three risk items. Bivariate correlations for all of the risk items were between 0.72 and 0.75. The alpha coefficient for the overall scale was 0.89 which was very good reliability for a new measure. Item to total correlations were between 0.78 and 0.80. Bivariate and item-total correlations are given in Tables 4.6 and 4.7.

Factor Analysis: Factor analysis was used to analyze the data. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.75, and Barlett's Test of Sphericity was rejected at $p<0.05$. One factor explaining 73.7 percent of the variance in the measure was extracted, and factor loadings for that factor are given in Table 4.7. Since the scale was unidimensional, a single summed risk score (SUM_RISK2) was created by adding the scores from all three risk items.

Table 4.5: Bivariate correlations for variables pertaining to cold OTCs in general

Variables	SEARCH1	KNOW	OTC_USE	OTHER_OTC	HPROBLM	HSTATUS	H_EXP	SEX	AGE	RISK1
SUM_RISK1	.173[a]	-.203[a]	-.072	.091	-.096	-.146	.081	.158[a]	.103	.802[a]
RISK1	.185[a]	-.032	-.036	.146	-.032	-.155	.113	.213[a]	-.003	1.000
AGE	-.057	.029	-.002	-.025	.006	-.224[a]	.018	-.173[a]	1.000	
SEX	.077	.083	.068	.142	.065	-.030	.162[a]	1.000		
H_EXP	.004	.187[a]	.108	.172[a]	-.015	.106	1.000			
HSTATUS	-.063	.114	-.106	-.125	-.285[a]	1.000				
HPROBLM	.023	.275[a]	.103	.186[a]	1.000					
OTHER_OTC	.020	.232[a]	.172[a]	1.000						
OTC_USE	-.056	.124	1.000							
KNOW	.037	1.000								
SEARCH1	1.000									

[a] Significant at $p<0.05$

Table 4.6: Correlation matrix for items RISK2, SAFE2 and COMF2

Item	RISK2	SAFE2	COMF2
RISK2	1.00	--	--
SAFE2	0.75	1.00	--
COMF2	0.72	0.74	1.00

Table 4.7: Item-total correlations and factor loadings for items RISK2, SAFE2 and COMF2

Item	Mean (S.D.)	Item-total correlation	Alpha if deleted	Factor loadings
RISK2	3.30 (1.47)	0.78	0.84	0.854
SAFE2	3.39 (1.27)	0.80	0.83	0.880
COMF2	3.56 (1.63)	0.78	0.85	0.841

The number of side effects for Cold-Arrest consisted of two different levels: two (few) versus four (many). Frequencies, mean and standard deviation for SUM_RISK2 measured at each level of side effect are reported in Table 4.4. Perceived risk for Cold-Arrest with four side effects (mean = 10.66; S.D. = 4.21) was higher than for Cold-Arrest with two side effects (mean = 9.84; S.D. = 3.70) but the difference was not significant at $p<0.05$. When considered individually, mean scores for the single item RISK2 were 3.15 (S.D. = 1.39) and 3.45 (S.D. = 1.55) for Cold-Arrest with two and four side effects respectively.

Bivariate correlations: Correlations between SUM_RISK2 and various demographic and health variables were examined. Correlation results are presented in Table 4.8. The correlation between SUM_RISK2 and self-reported health status (HSTATUS) was negative

Table 4.8: Bivariate correlations for variables pertaining to Cold-Arrest with two or four side effects

Variables	SEARCH2	KNOW	COLD_USE	OTHER_OTC	HPROBLM	HSTATUS	H_EXP	SEX	AGE	RISK2
SUM_RISK2	.397	-.084	-.414[a]	.150	-.035	-.241[a]	-.019	.149	.103	.893[a]
RISK2	.345[a]	.016	-.360[a]	.160[a]	.003	-.171[a]	-.039	.168[a]	.060	1.000
AGE	-.022	.029	-.078	-.025	.006	-.224[a]	.018	-.173[a]	1.000	
SEX	.201[a]	.083	-.060	.142	.065	-.030	.162[a]	1.000		
H_EXP	-.001	.187[a]	-.032	.172[a]	-.015	.106	1.000			
HSTATUS	-.251[a]	.114	.047	-.125	-.285[a]	1.000				
HPROBLM	.035	.275[a]	.061	.186[a]	1.000					
OTHER_OTC	-.012	.232[a]	-.035	1.000						
COLD_USE	-.221[a]	-.024	1.000							
KNOW	.038	1.000								
SEARCH2	1.000									

[a] Significant at $p<0.05$

and moderate (-0.24). SUM_RISK2 was also significantly and negatively correlated with prior use of an OTC cold product similar to Cold-Arrest (COLD_USE). Correlations between the single item RISK2 and demographic and health related variables are also reported in Table 4.8. RISK2 was positively and significantly correlated with prior use of any OTC products other than for a cold within the past one month (OTHER_OTC) and gender (SEX). However, it was negatively correlated with health status (HSTATUS) and prior use of an OTC cold product similar to Cold-Arrest (COLD_USE).

3. Overall Perceived Risk of Cold Arrest in a scenario: OPR_3 = {PCR, PSR, SSR}

A single item measure (RISK3) was used to measure the perceived risk of using Cold-Arrest in a scenario with a past health problem. Rash and hepatitis were the two levels of past health problems used in the scenarios. Frequencies, mean and standard deviation for RISK3 for each health problem and Cold-Arrest label are reported in Table 4.9. Perceived risk was lowest when using Cold-Arrest with two side effects and having a past rash problem (mean = 4.75; S.D. = 1.60), and highest when using Cold-Arrest with four side effects and having hepatitis in the past (mean = 6.53; S.D. = 0.68).

Correlations between RISK3 and various demographic and health related variables were examined. Correlation results are presented in Table 4.10. The correlation between RISK3 and health care experience was significant and positive at 0.21.

In summary, respondents perceived Cold-Arrest as higher risk than cold OTCs in general. Cold-Arrest with four side effects was also perceived as more risky than Cold-Arrest with two side effects although the difference was not significant at $p<0.05$. Finally,

Table 4.9: Overall perceived risk frequencies and percentages for Cold-Arrest by side effects and scenarios

Score	Rash scenario		Hepatitis scenario	
	2 side effects (N = 40)	4 side effects (N = 40)	2 side effects (N = 40)	4 side effects (N = 40)
1	1 (2.5%)	2 (5.0%)	--	--
2	3 (7.5%)	--	--	--
3	7 (17.5%)	4 (10.0%)	1 (2.5%)	--
4	3 (7.5%)	6 (15.0%)	1 (2.5%)	--
5	10 (25.0%)	10 (25.0%)	4 (10.0%)	4 (10.0%)
6	12 (30.0%)	11 (27.5%)	14 (35.0%)	11 (27.5%)
7	4 (10.0%)	7 (17.5%)	20 (50.0%)	24 (62.5%)
Mean (S.D.)	4.75 (1.60)	5.08 (1.54)	6.28 (0.93)	6.53 (0.68)

Table 4.10: Bivariate correlations for variables pertaining to using Cold-Arrest with a past health problem

Variables	SEARCH3	KNOW	OTC_EXP3	OTHER_OTC	HPROBLM	HSTATUS	H_EXP	SEX	AGE
RISK3	.162 [a]	.016	-.019	.036	-.096	.085	.212 [a]	.106	.119
AGE	.119	.029	.193 [a]	-.025	.006	-.224 [a]	.018	-.173 [a]	
SEX	.106	.083	-.021	.142	.065	-.030	.162 [a]	1.000	1.000
H_EXP	.212 [a]	.187 [a]	.077	.172 [a]	-.015	.106	1.000		
HSTATUS	.085	.114	-.147	-.125	-.285 [a]	1.000			
HPROBLM	-.096	.275 [a]	.068	.186 [a]	1.000				
OTHER_OTC	.036	.232 [a]	.118	1.000					
OTC_EXP3	-.019	.042	1.000						
KNOW	.016	1.000							
SEARCH3	1.000								

[a] Significant at $p<0.05$

when compared across the hypothetical situations, Overall Perceived Risk was highest when using Cold-Arrest with four side effects and having hepatitis in the past, and was lowest when using Cold-Arrest with two side effects and having a past rash problem. Summary comparison results of the single item RISK across cold OTCs in general, Cold-Arrest by side effects and Cold-Arrest by side effects and past health problems are presented in Table 4.11.

Table 4.11: Means and standard deviations of overall perceived risk

	OPR type	N	Measure	Mean (S.D.)
Cold OTCs in general	OPR_1	160	RISK1	2.54 (1.06)
Cold-Arrest	OPR_2		RISK2	
2 side effects		80		3.15 (1.39)
4 side effects		80		3.45 (1.55)
Cold-Arrest with past health problem	OPR_3		RISK3	
2 side effects; rash		40		4.75 (1.60)
4 side effects; rash		40		5.08 (1.54)
2 side effects; hepatitis		40		6.28 (0.93)
4 side effects; hepatitis		40		6.53 (0.68)

D. Information Search Results:

1. Information Search to Reduce Overall Perceived Risk (OPR_1) of Cold OTC Products:

Item SEARCH1 measured whether or not a respondent would look for more information before buying a new OTC cold product that s/he has never used before. Sixty five percent of respondents would search for new information after reading the label for general cold OTCs while 35 percent would not. Information search was significantly correlated with Overall Perceived Risk for cold OTCs in general (both SUM_RISK1 and RISK1). Correlation results are presented in Table 4.5.

Frequencies for information sources for cold OTCs in general most often used and most preferred are listed in Table 4.12. Respondents indicated that they used expert impersonal sources (i.e., OTC package label) most often. Non-expert interpersonal sources (i.e., family members) were used more often than expert interpersonal sources such as pharmacists and physicians. Pharmacists were also used more often than physicians. However, respondents would most prefer to use expert interpersonal sources the most. While pharmacists were still preferred over physicians, the percentage of those using physicians most often increased from 3.1 to 21.3 percent in those preferring to use physicians.

2. Information Search to Reduce Overall Perceived Risk (OPR_2) of Cold Arrest:

Item SEARCH2 measured whether the respondent would look for more information before taking Cold-Arrest. Approximately sixty-two percent of respondents reported they would search for more information after reading the label with four side effects while 55 percent would search after reading the label with two side effects.

Information search was significantly and positively correlated with Overall Perceived Risk of Cold-Arrest (both SUM_RISK2 and RISK2) and gender (SEX) but negatively correlated with health status (HSTATUS) and prior use of an OTC cold product similar to Cold-Arrest (COLD_USE). Correlation results are presented in Table 4.8.

Table 4.13 summarizes the frequencies and percentages for information sources intended to use and preferred for Cold-Arrest across the different numbers of side effects. Approximately seventy seven percent of respondents searching for more information after reading Cold-Arrest label with two side effects indicated that they would use expert interpersonal sources. Similarly, the majority (90.9%) of respondents preferred to use expert interpersonal sources. Again, just like for cold OTCs in general, pharmacists were preferred over physicians as sources of information for Cold-Arrest but the percentage of those intending to use physicians increased from 13.6 to 22.7 percent in those preferring to use physicians. About seventy percent of respondents who received Cold-Arrest label for four side effects would use expert interpersonal sources. The next information source would be family. The majority preferred using an expert interpersonal source that was a pharmacist.

3. Information Search to Reduce Overall Perceived Risk (OPR_3) in Scenarios:

Item SEARCH3 measured whether the respondent would look for more information before taking Cold-Arrest in specific past health problem scenarios. Their frequencies are listed in Table 4.14. In both scenarios, the majority of respondents indicated that they would search for more information. However, fewer people would look for more information when they receive a label with four side effects than when they receive a label with two side effects in both scenarios.

Table 4.12: Frequencies and percentages for information sources most often used and preferred for cold OTC products in general

Source	Cold OTCs N = 160	
	Often used	Preferred
Pharmacist	27 (17.0%)	70 (43.8%)
Physician	5 (3.1%)	34 (21.3%)
Refbook	2 (1.3%)	4 (2.5%)
OTC label	80 (50.3%)	27 (16.9%)
Family	36 (22.6%)	21 (13.1%)
Friend	6 (3.8%)	4 (2.5%)
Ad	3 (1.9%)	--
Other	--	--

Table 4.13: Frequencies and percentages for information sources most intended and preferred to use for Cold-Arrest by side effects

Source	Cold-Arrest with 2 side effects N = 80		Cold-Arrest with 4 side effects N = 80	
	Intended to use	Preferred	Intended to use	Preferred
Pharmacist	28 (63.6%)	30 (68.2%)	29 (56.9%)	34 (66.7%)
Physician	6 (13.6%)	10 (22.7%)	6 (11.8%)	8 (15.7%)
Refbook	2 (4.5%)	1 (2.3%)	2 (3.9%)	2 (3.9%)
Family	4 (9.1%)	1 (2.3%)	8 (15.7%)	3 (5.9%)
Friend	3 (6.8%)	--	3 (5.9%)	1 (2.0%)
Ad	1 (2.3%)	2 (4.5%)	--	--
Other	--	--	3 (5.9%)	3 (5.9%)

Table 4.14: Frequencies and percentages for information search

	N	Info Search
Cold OTCs in general	160	104 (65.0%)
Cold-Arrest		
2 side effects	80	44 (55.0%)
4 side effects	80	50 (62.5%)
Cold-Arrest with past health problem		
2 side effects; rash	40	30 (75.0%)
4 side effects; rash	40	28 (70.0%)
2 side effects; hepatitis	40	36 (90.0%)
4 side effects; hepatitis	40	33 (82.5%)

Correlation results are presented in Table 4.10. SEARCH3 was significantly correlated with RISK3 and health care experience (H_EXP).

Refer to Table 4.15 for summary results of Overall Perceived Risk means (RISK item) and information search percentages across all products and scenarios. Overall Perceived Risk was lowest for cold OTCs in general and highest for Cold-Arrest with four side effects and having hepatitis in the past. Information search was higher when using Cold-Arrest with two side effects than when using Cold-Arrest with four side effects across both rash and hepatitis scenarios even though Overall Perceived Risk was consistently higher for Cold-Arrest with four side effects than Cold-Arrest with two side effects.

Table 4.15: Overall perceived risk means and information search percentages

	N	OPR mean (S.D.)		Infosearch % (N)
Cold OTCs in general	160	OPR_1	2.54 (1.06)	65.0% (104)
Cold-Arrest (2 SE)	80	OPR_2	3.15 (1.39)	55.0% (44)
Cold-Arrest (4 SE)	80		3.45 (1.55)	62.5% (50)
Cold-Arrest (2 SE; rash)	40	OPR_3	4.75 (1.60)	75.0% (30)
Cold-Arrest (4 SE; rash)	40		5.08 (1.54)	70.0% (28)
Cold-Arrest (2 SE; hepatitis)	40		6.28 (0.93)	90.0% (36)
Cold-Arrest (4 SE; hepatitis)	40		6.53 (0.68)	82.5% (33)

SE = side effects

Frequencies for information sources respondents intended and preferred to use for Cold-Arrest by side effects and scenarios are presented in Table 4.16. The majority of respondents reported that they would use the pharmacist, an expert interpersonal source of information, in both rash and hepatitis scenarios across both two and four side effects. In the rash scenario, slightly more respondents reported that they would use a family member (13.3% for two side effects; 13.8% for four side effects), a non-expert interpersonal source of information, than they would a physician (10.0% for two side effects; 6.9% for four side effects), an expert interpersonal source of information. However, the reverse is true in the hepatitis scenario where significantly more respondents reported that they would use the physician (42.5% for two side effects; 37.5% for four side effects) than they would a family member (0% for two side effects; 6.3% for four side effects).

Additionally, the majority of respondents indicated that they would prefer to use the pharmacist as their source of information in the rash scenario across two and four side effects (62.1% for both). On the contrary, they preferred to use a physician in the hepatitis scenario (51.4% for two side effects; 50.0% for four side effects). However, the number of respondents preferring to use a pharmacist was still high in the hepatitis scenario. Only one respondent indicated that s/he would use a family member in the hepatitis scenario.

Table 4.16: Frequencies and percentages for information sources intended and preferred to use for Cold-Arrest by number of side effects and scenarios

Source	Rash scenario				Hepatitis scenario			
	2 side effects N = 40		4 side effects N = 40		2 side effects N = 40		4 side effects N = 40	
	Intended	Preferred	Intended	Preferred	Intended	Preferred	Intended	Preferred
Pharmacist	16 (53.3%)	18 (62.1%)	18 (62.1%)	18 (62.1%)	19 (54.3%)	15 (42.5%)	17 (53.1%)	14 (43.8%)
Physician	3 (10.0%)	6 (20.7%)	2 (6.9%)	5 (17.2%)	15 (42.5%)	18 (51.4%)	12 (37.5%)	16 (50.0%)
Refbook	3 (10.0%)	1 (3.4%)	3 (10.3%)	4 (13.8%)	1 (2.9%)	1 (2.9%)	--	--
Family	4 (13.3%)	2 (6.9%)	4 (13.8%)	1 (3.4%)	--	1 (2.9%)	2 (6.3%)	--
Friend	2 (6.7%)	--	--	--	--	--	--	--
Ad	1 (3.3%)	1 (3.4%)	--	--	--	--	--	--
Other	1 (3.3%)	1 (3.4%)	2 (6.9%)	1 (3.4%)	--	--	1 (3.1%)	2 (6.3%)

STUDY HYPOTHESES TESTING

A. Research Question 1:

The first research question was to study the effects of consumers' overall perceived risk on information search.

H1: Consumers with higher overall perceived risk search for more information.

Two different types of perceived risk were measured: inherent and handled. The levels of handled risk were manipulated in two different ways: the number of side effects and the seriousness of past health problems.

The mean scores for inherent risk (SUM_RISK1 and RISK1) and handled risk (SUM_RISK2, RISK2 and RISK3) were all significantly higher for respondents who would search for additional information than for those who would not search for additional information when tested using a two-tailed student t-test ($p<0.05$). Table 4.17 presents the results of the two-tailed student t-tests between respondents searching and not searching information.

Table 4.17: Student t-test comparison results between those searching and not searching for more information

Variable	INFOSEARCH	N	Mean (S.D.)	Mean difference
SUM_RISK1	No	56	7.38 (2.46)	0.83 [a]
	Yes	104	8.20 (2.56)	
SUM_RISK2	No	66	8.50 (3.57)	2.98 [a]
	Yes	94	11.48 (3.79)	
RISK1	No	56	2.29 (0.91)	0.39 [a]
	Yes	104	2.67 (1.11)	
RISK2	No	66	2.73 (1.39)	0.97 [a]
	Yes	94	3.70 (1.41)	
RISK3	No	33	5.09 (1.76)	0.71 [a]
	Yes	127	5.80 (1.33)	

[a] Significant at $p<0.05$

Additionally, Overall Perceived Risk, whether measured as a summed score of a three-item measure (SUM_RISK) or rated by a single item (RISK) was the best predictor of information search in every full logistic regression model ($p<0.05$) containing the demographic and health related variables previously discussed. Health status (HSTATUS) and gender (SEX) in addition to RISK2 were found to predict information search for Cold-Arrest (SEARCH2). Only RISK3 was a predictor of information search (SEARCH3) in scenarios of hepatitis versus rash. Inherent risk (RISK1) was found to be the best predictor of information search (SEARCH1) with significance at $p<0.05$. All terms were entered simultaneously into their respective models. Due to the small sample size, interaction effects were not tested. Tables 4.18 and 4.19 present the full logistic regression models for the three types of Overall Perceived Risk.

From the results of these tests, the first study hypothesis that consumers with higher overall perceived risk would search for more information was not rejected.

B. Research Question 2:

The second research question was to study the effects of consumers' overall perceived risk on different sources of information. Two hypotheses tested for this research question were:

H2: Consumers with higher overall perceived risk seek more expert interpersonal sources (e.g., physician or pharmacist's advice) as a source of information.

H3: Consumers with higher overall perceived risk prefer more expert interpersonal sources (e.g., physician or pharmacist's advice) as a source of information.

Across every type of Overall Perceived Risk, except for cold OTCs in general where fifty percent would use the label, respondents consistently and overwhelmingly indicated that they would use or prefer to use an expert interpersonal source of information with the combined percentages for both pharmacist and physician ranging from 63.3 to 96.8 percent. Because of these findings and also due to the small number of respondents in the sample who indicated they would search for more information from non-expert interpersonal (e.g., family or friends) or expert impersonal sources (e.g., reference book), both univariate and multivariate analyses were not performed to test these two hypotheses regarding intended usage and preference of information sources. For a comparison of the two sources of information, see Tables 4.12, 4.13 and 4.16.

Table 4.18: Logistic regression models for information search using SUM_RISK

Variables	Cold OTCs (SEARCH1)		Cold-Arrest (SEARCH2)	
	B (S.E.)	Odds ratio	B (S.E.)	Odds ratio
SEX	0.35 (0.36)	1.42	0.79 (0.39)	2.20 [a]
AGE	0.05 (0.05)	1.05	-0.06 (0.05)	0.94
KNOW	0.14 (0.18)	1.15	0.21 (0.19)	1.23
H_EXP	-0.19 (0.39)	0.83	0.01 (0.42)	1.01
HSTATUS	-0.06 (0.25)	0.94	-0.74 (0.29)	0.48 [a]
HPROBLM	0.04 (0.45)	1.04	-0.16 (0.48)	0.85
OTHER_OTC	-0.01 (0.37)	0.99	-0.65 (0.41)	0.52
OTC_USE	-0.87 (1.17)	0.42	-0.11 (1.04)	0.90
COLD_USE	--	--	-0.38 (0.61)	0.68
SUM_RISK1	0.13 (0.08)	1.135 [b]	0.01 (0.09)	1.01
SUM_RISK2	--	--	0.21 (0.07)	1.23 [a]

[a] Significant at $p<0.05$; [b] Significant at $p<0.1$

Table 4.19: Logistic regression models for information search using RISK

Variables	Cold OTCs (SEARCH1)		Cold-Arrest (SEARCH2)		Cold-Arrest with scenario (SEARCH3)	
	B (S.E.)	Odds ratio	B (S.E.)	Odds ratio	B (S.E.)	Odds ratio
SEX	0.32 (0.36)	1.38	0.79 (0.39)	2.20 [a]	0.14 (0.46)	1.16
AGE	0.06 (0.05)	1.07	-0.06 (0.05)	0.94	-0.08 (0.06)	0.92
KNOW	0.09 (0.17)	1.10	0.21 (0.19)	1.23	-0.06 (0.22)	0.94
H_EXP	-0.19 (0.39)	0.83	0.02 (0.42)	1.01	0.20 (0.49)	1.22
HSTATUS	-0.06 (0.25)	0.94	-0.74 (0.29)	0.48 [a]	-0.48 (0.33)	0.62
HPROBLM	0.03 (0.25)	0.97	-0.16 (0.48)	0.85	-0.54 (0.55)	0.58
OTHER_OTC	-0.05 (0.37)	0.95	-0.65 (0.41)	0.52	-0.10 (0.46)	0.90
OTC_USE	-0.87 (1.17)	0.42	-0.11 (1.04)	0.90	-7.54 (44.29)	0.00
COLD_USE	--	--	-0.38 (0.61)	0.68	0.26 (0.62)	1.29
OTC_EXP3	--	--	--	--	6.23 (22.81)	530.07
RISK1	0.36 (0.18)	1.44 [a]	0.02 (0.09)	1.01	-0.04 (0.23)	0.96
RISK2	--	--	0.21 (0.07)	1.23 [a]	-0.22 (0.18)	0.80
RISK3	--	--	--	--	0.38 (0.15)	1.47 [a]

[a] Significant at $p<0.05$; [b] Significant at $p<0.1$

CHAPTER 5

DISCUSSION AND CONCLUSIONS

This chapter provides a discussion and interpretation of the most important study results for both descriptive statistics and hypothesis testing. These results will be augmented by respondents' comments to open-ended questions regarding reasons for rating overall perceived risk, and choosing information search and sources the way they indicated on the questionnaires. Furthermore, future research implications will be presented followed by study limitations.

DISCUSSION OF RESULTS

A. Overall Perceived Risk:

Study results indicated that respondents perceived Cold-Arrest as more risky than cold OTCs in general. Cold-Arrest with four side effects was also perceived as higher risk than with two side effects. When comparing the risk of using Cold-Arrest with two side effects across the two scenarios, respondents perceived higher risk for using the OTC in conjunction with having a past hospitalization for hepatitis than with a rash problem. This pattern was also consistent for Cold-Arrest with four side effects.

These results suggest that Product Category Risk (PCR) of cold OTCs in general is low. Several reasons were given by the respondents, e.g., their trust in the FDA to test a drug for its safety before approving it as OTC status, their not having prior health problems, and that when OTC labeling directions are carefully read and properly followed, there should be no problems.

However, respondents did rate their overall perceived risk of a specific brand, i.e., Cold-Arrest, as higher, especially when given labeling information that contained four side effects. Risk was also perceived differently for Cold-Arrest across different past health problem scenarios. Respondents felt that it was extremely risky if they had hepatitis before due to the clear warning on the label about liver disease. Furthermore, importance of loss is very important in addition to probability of loss when considering OTC risk. According to respondents' comments, the importance of loss or seriousness of adverse effects from using Cold-Arrest in the hepatitis scenario was great because it could further aggravate their health problem.

These results suggest that while cold OTCs are generally perceived as safe, their overall perceived risk can be increased due to different product characteristics, e.g., number of side effects on the label, and situational needs, e.g., severity of a past health problem. This supports the study's theoretical framework that proposed three different components to Overall Perceived Risk: Product Category Risk (PCR), Product Specific Risk (PSR) and Situation Specific Risk (SSR). Previous OTC research has typically studied only PCR, resulting in low OTC perceived risk. Therefore, risk perceptions of OTCs in future studies could change if both components of PSR and SSR were to be added and explored further.

B. Reducing Overall Perceived Risk through Extrinsic Information Search:

Study results indicated that the higher the overall perceived risk, the greater likelihood of respondents searching for extrinsic information. They were more likely to engage in additional search for Cold-Arrest with four side effects than for two side effects. Reasons were given that they wanted to know more about the side effects given on the label,

both in terms of severity and frequency. This supports the paradigm used in this research and in marketing literature that consumers try to reduce the uncertainty component of risk by acquiring more information.

However, while overall perceived risk for Cold-Arrest with four side effects was always greater than for two side effects across the rash and hepatitis scenarios, the percentage of those seeking information actually decreased when four side effects were given on the label. This contradictory relationship between perceived risk and information search can be explained from respondents' comments of why they would not search for more information after reading the label with four side effects. Their overall perceived risk of Cold-Arrest was so high and unacceptable that they had absolutely no intention of using the product. Subsequently, they would not search for more information. Therefore, another important issue that needs to be addressed in future OTC risk research is the concept of acceptable risk.

Other reasons for not searching for more information when overall perceived risk was high included inconvenience and a low perception of individual susceptibility to the adverse effects on the label. These results suggest that consumers have different risk tolerance ranges which have a direct effect on whether or not they would search for more information. It is therefore very important that the acceptable or tolerable level of perceived risk is explored in future research because high risk perceptions do not necessarily lead to more information search.

C. Reducing Overall Perceived Risk through Choice of Information Source:

Descriptive statistics results showed that when overall perceived risk was low for cold OTCs in general, the majority of respondents used OTC package label and non-expert

interpersonal sources of information, i.e., family, more often than expert interpersonal sources such as pharmacists and physicians. This is consistent with findings in the marketing literature that consumers relied on consumer interpersonal informational sources such as word-of-mouth communication to reduce their perceived risk. However, they preferred to use a pharmacist or a physician.

In contrast to general cold OTCs, respondents would use and preferred to use expert interpersonal sources for information on the specific product of Cold-Arrest. Respondents typically would use and preferred pharmacists over physicians for information on using Cold-Arrest in the rash scenario. However, when overall perceived risk was higher, i.e., in the hepatitis scenario, the difference in intended use and preference between pharmacists and physicians became much smaller. For hepatitis, more respondents would use a pharmacist but preferred a physician. Further insight can be gained from respondents' comments.

Many respondents indicated that a pharmacist was the best source of information on drug interactions, side effects, ingredients and effectiveness. These are all related to product characteristics and are part of Product Specific Risk. A pharmacist was also more easily accessible and available than a physician. Additionally, they should be able to answer questions if the respondents had no serious pre-existing health problems. However, they would still ask the pharmacist about using Cold-Arrest if they had hepatitis because they wanted to know more about the side effects and hoped that the pharmacist could recommend a safer OTC product.

Reasons for choosing and preferring a physician over a pharmacist were less related to product characteristics and more part of Situation Specific Risk. Respondents explained that a physician should have more complete and informed knowledge of their medical history

and expertise on diseases such as hepatitis, therefore should be able to explain to them how Cold-Arrest would affect their health condition.

In conclusion, these results suggest that when overall perceived risk is high, consumers would use and prefer expert interpersonal sources to acquire additional information to reduce risk. The rash problem was not considered as a serious adverse consequence, therefore the respondent was more likely to use and prefer the pharmacist as the source of information to reduce their perceived risk. However, when adverse consequences were perceived as more serious as in the case of having a past history of hepatitis, there was an increase in intended use and preference for a physician as a source of information. Additionally, their decision to use a pharmacist or a physician was influenced by the type of perceived risk. A pharmacist was more likely to be used to reduce Product Specific Risk and a physician to reduce Situation Specific Risk.

It is acknowledged that health care experience could have biased the results since the majority of respondents were pharmacy students. Therefore, future analyses could be done to study if there are any differences between respondents with and without health care experience on their sources of information. Non-pharmacy students may be more likely to choose or prefer a physician over a pharmacist while the reverse could be true for pharmacy students.

RESEARCH IMPLICATIONS

When conceptualizing overall perceived risk as a multidimensional construct, previous marketing and pharmacy perceived risk literature tended to focus more on the different types of adverse consequences, one of the two components of the perceived risk

construct. Therefore, there are many studies that have explored overall perceived risk in terms of being a composite of performance, social, psychological, physical (safety), and financial risks. This study instead chose to focus on one type of risk, i.e., safety risk, but still proposed that overall perceived risk is multidimensional and comprises of three components: Product Category Risk, Product Specific Risk and Situation Specific Risk.

Furthermore, most previous OTC research studied only Product Category Risk. This may result in lower reported OTC risk perceptions. OTC risk may be more accurately measured if Product Specific Risk and Situation Specific Risk are incorporated. While cold OTCs are generally perceived as safe, the overall perceived risk of a specific OTC product can be increased when it is evaluated in terms of product characteristics and situational needs of the user. Because of this, OTC risk perceptions may be higher than generally assumed. With increasing prescription to OTC switches, pharmacists' role as an OTC drug advisor becomes even more important, especially when consumers want to know more about specific characteristics of OTC products which are most salient to their personal needs or characteristics.

Overall perceived risk was the best predictor of information search across side effects and scenarios. Subjects perceived and distinguished that there were different types and levels of risk. They were more likely to search for more information beyond the label when the severity of a past health problem increased. Pharmacists can become an important information source because of their accessibility and knowledge.

Additionally, subjects were able to evaluate and use risk information on the OTC label. They were less likely to search for information about Cold-Arrest than for cold OTCs in general when given labeling information about the side effects even though overall

perceived risk was higher. They explained that additional search was not needed because side effect labeling information was very clear and adequate so they were able to reduce the level of perceived risk. This finding suggests that OTC labels can be a good source of information if contents are fair and balanced, and clear and complete.

Finally, overall perceived risk for Cold-Arrest with four side effects was higher than for two side effects across both hepatitis and rash scenarios, but information search was lower. Subjects explained that they were less likely to search for information because they were too afraid to use the product. Acceptable or tolerable levels of perceived risk should be considered in future research because very high risk perceptions may not lead to more information search.

STUDY LIMITATIONS

There are several limitations to this research which should be kept in mind when interpreting or using the results.

First, a judgment sample of young university students was used; therefore, it will be important to test generalizability of the findings with other populations. An older non-student population with a lower health status and higher concurrent use of prescription medications may have very different OTC risk perceptions. However, precisely because of these differences in demographic and health related characteristics, a decision was made to limit the research to just one type of study population. Additionally, the sample size was 160 subjects. It will have to be increased to gain enough power to test for interaction effects.

Social desirability could also be a possible source of bias in the results due to health care experience. Pharmacy students may be more likely to choose or feel that they need to

indicate that they would use or prefer a pharmacist over a physician because of their discipline and because the study researcher also has a pharmacy background.

Another limitation is that the research was not done in a naturalistic setting and a hypothetical cold medication was used in written scenarios rather than real-time OTC decisions. There is a need to replicate this study at the time of a real OTC selection. While the generalizability of the results may be limited, an argument could be made that the experimental factorial design using hypothetical information allowed for more control and ease in manipulating levels and types of perceived risk and in understanding their effects on information search. The next step then would be to conduct the research in a naturalistic setting using real OTC cold products.

Lastly, global measures of overall perceived risk, both multi-item and single item, were used in the study instead of measuring the components of uncertainty and consequences separately. It will be important to develop a multi-item measure that will capture the two-dimensionality of perceived risk.

However, the concept of perceived risk has been operationalized differently in various disciplines. The research focus here was on the product category of OTCs which is a hybrid between a non-medical consumer good and a prescription drug product. To the researcher's best knowledge, there is no published study in pharmacy that has specifically addressed the issue of whether those two risk dimensions should be combined additively or multiplicatively to form overall perceived risk of OTCs. Therefore, a decision was made to use a global measure of overall perceived risk because the relationship between the dimensions could potentially be very different from that used typically in research on either non-medical consumer goods or prescription medications.

CONCLUSION

Study findings suggest the usefulness of combining two additional risk components, Product Specific Risk and Situation Specific Risk, to capture perceptions of OTC risk from both a research and practice perspective. Past pharmacy research has traditionally studied only the component of Product Category Risk of OTC medications. This might have resulted in lower risk perceptions of OTCs; therefore, it is important that future research examine the two additional components of Product Specific Risk and Situation Specific Risk.

Additionally, pharmacists can become an important source of OTC advice because this research suggests that consumers were able to assess their need for additional information based on labeling information. They were more likely to search for more information when overall perceived risk was higher. They also preferred and intended to use more expert interpersonal information sources such as a pharmacist when overall perceived risk was higher. This could be very important in expanding pharmacists' roles, especially in the present environment with a trend toward self-care and increasing medication switches from prescription only to OTC status.

Lastly, it is apparent that consumers reading labeling information are influenced by its content. FDA's (1997) proposed labeling requirements for OTC products may offer an important opportunity to impact on consumers' information search intensity and strategies. Therefore, OTC package labeling information must be carefully selected and clearly presented.

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APPENDIX A

Cold-Arrest Labels

Cold-Arrest Package Label with 2 Side Effects

Let's assume that this is the first day that you've come down with a slight fever and you have a runny and stuffy nose. So you've decided to buy an OTC cold product called **Cold-Arrest** to treat the cold yourself. Now, please read the following drug package label called **Label A** for **Cold-Arrest** and use it to answer the questions on **pages 4-12** of the survey.

COLD-ARREST Package Label A

Active Ingredient (In Each Tablet).....Purpose
Chlordextrominophen 15 mg.....Fever Reliever, Antihistamine, Nasal Decongestant

Uses: for the temporary relief of these cold symptoms

- sneezing
- running nose
- nasal congestion, stuffiness
- itchy, watery eyes
- fever

Warnings

Ask a Doctor or a Pharmacist Before Use

If You Have:

- a breathing problem such as emphysema or chronic bronchitis
- thyroid disease
- liver disease

If You Are:

- taking sedatives or tranquilizers
- consuming 3 or more alcohol-containing drinks per day
- pregnant or breast-feeding

When Using This Product:

- marked drowsiness may occur
  - alcohol, sedatives, and tranquilizers may increase the drowsiness effect
  - use caution when driving a motor vehicle or operating machinery
  - avoid alcoholic beverages
- excitability may occur, especially in children
- do not take for fever for more than 3 days unless directed by a physician

Stop Using This Product and Ask a Doctor or a Pharmacist Right Away If:

- you are allergic to the product and have hives, redness, swelling or breathing problems
- you are nervous or cannot sleep
- your fever persists or worsens

Keep out of reach of children. In case of overdose, get medical help right away.

Directions:

Adults and children over 12 years	Take 1 tablet every 4 to 6 hours as needed. Do not take more than 6 tablets in 24 hours.
Children 6 to under 12 years	Take ½ tablet every 4 to 6 hours as needed. Do not take more than 3 tablets in 24 hours.
Children under 6 years	Ask a doctor or a pharmacist.

Cold-Arrest Package Label with 4 Side Effects

Let's assume that this is the first day that you've come down with a slight fever and you have a runny and stuffy nose. So you've decided to buy an OTC cold product called **Cold-Arrest** to treat the cold yourself. Now, please read the following drug package label called **Label A** for **Cold-Arrest** and use it to answer the questions on **pages 4-12** of the survey.

COLD-ARREST Package Label A

Active Ingredient (In Each Tablet).....Purpose
Chlordextrominophen 15 mg.....Fever Reliever, Antihistamine, Nasal Decongestant

Uses: for the temporary relief of these cold symptoms

- sneezing
- running nose
- nasal congestion, stuffiness
- itchy, watery eyes
- fever

Warnings

Ask a Doctor or a Pharmacist Before Use

If You Have:

- a breathing problem such as emphysema or chronic bronchitis
- thyroid disease
- liver disease

If You Are:

- taking sedatives or tranquilizers
- consuming 3 or more alcohol-containing drinks per day
- pregnant or breast-feeding

When Using This Product:

- marked drowsiness may occur
  - alcohol, sedatives, and tranquilizers may increase the drowsiness effect
  - use caution when driving a motor vehicle or operating machinery
  - avoid alcoholic beverages
- liver damage may occur in people with liver disease
- nausea and vomiting may occur
- diarrhea or loose stools may occur
- do not take for fever for more than 3 days unless directed by a physician

Stop Using This Product and Ask a Doctor or a Pharmacist Right Away If:

- you are allergic to the product and have hives, redness, swelling or breathing problems
- you are nervous or cannot sleep
- your fever persists or worsens

Keep out of reach of children. In case of overdose, get medical help right away.

Directions:

Adults and children over 12 years	Take 1 tablet every 4 to 6 hours as needed. Do not take more than 6 tablets in 24 hours.
Children 6 to under 12 years	Take ½ tablet every 4 to 6 hours as needed. Do not take more than 3 tablets in 24 hours.
Children under 6 years	Ask a doctor or a pharmacist.

APPENDIX B

Past Health Problem Scenarios

Rash scenario

You've come down with a cold. You have a slight fever and your nose is runny and stuffy. You think that he cold will go away on its own soon but you dislike not being able to breathe easily through your nose. **In the past when you used your friend's OTC cold medicine, you noticed that you got a red rash on your face which went away a couple of days after you stopped taking it.** So this time you've decided to buy **Cold-Arrest** rather than use your friend's OTC cold medicine.

Hepatitis scenario

You don't have any health problems except that **a month ago you had hepatitis and were hospitalized for one week**. You've just come down with a cold. You have a slight fever and your nose is runny and stuffy. You think that the cold will go away on its own soon but you dislike not being able to breathe easily through your nose. You've decided to buy **Cold-Arrest** to treat the cold yourself. (Note: Hepatitis is an inflammation of the liver and can affect the function of your liver.)

APPENDIX C

Cover Letter and Questionnaire

UNIVERSITY OF
WISCONSIN
MADISON

July 1998

Dear Student:

Over the last decade, many prescription drug products have switched from prescription to non-prescription or over-the-counter (OTC) status. In fact, you may have recently used an OTC drug product that was at one time only available as a prescription drug.

Within the next few years, more prescription drugs will be switched to OTC status so one can purchase them without a prescription. With these changes, it becomes very important to know how consumers feel about the safety of OTCs and their perceptions of risk when using those drug products.

Therefore, we are conducting an exploratory study to learn more about:

- how consumers perceive and evaluate the risks associated with using an OTC drug product, and
- the different sources of information consumers use to help them select an OTC drug product.

We need your help. You will be given two hypothetical situations related to the use of an imaginary OTC cold product called **Cold-Arrest**. Directions to answer the questions are on the attached survey. Your responses are anonymous. If you wish to comment on any of the questions, please do so on the last page of the survey. It will take you about 30 minutes to complete it.

Thank you for your time and help. Your cooperation is greatly valued and appreciated.

Nisa Sangasubana
MS Candidate

Joseph B Wiederholt, Ph.D.
Professor

425 N. Charter St. Madison, Wisconsin 53706-1515 608/262-1416 FAX 608/262-3397

Consumer OTC Risk Perceptions Survey
University of Wisconsin-Madison
Sonderegger Research Center

Before you begin the survey, please take a minute to read the following directions. Do not put your name on the survey. Your responses are anonymous.

The survey has seven parts:

Part 1: OTC Cold Products

These are questions on OTC cold products in general. For the purpose of this survey, an **OTC cold product** is defined as a drug product that you can buy without a prescription and is used to treat common cold symptoms such as a fever, a running nose and nasal congestion. **Risk** is defined as exposure to the possible **harmful effects** of using an OTC cold product.

Part 2: Cold-Arrest

Attached at the back of the survey is a drug package label called **Label A**  for an imaginary OTC cold product called **Cold-Arrest**. Detach it and use it to answer the questions in Part 2. Please read the label as if you were purchasing the product **for yourself**. The questions are about your use of **Cold-Arrest** to treat a minor cold.

Part 3: Scenario One

You are given a hypothetical scenario in which to use **Cold-Arrest**. Please read the scenario as if you were really in that situation. Use **Label A** to answer the questions.

Part 4: Scenario Two

You are given **another** hypothetical scenario in which to use **Cold-Arrest**. Please use **Label A** to answer the questions.

Part 5: Scenario Comparison

Using **Label A**, compare the risk of taking **Cold-Arrest** in five different scenarios.

Part 6: Label Comparison

Another drug package label called **Label B** is given for **Cold-Arrest**. Please compare it with **Label A**.

Part 7: Personal Information

These are general questions about yourself.

Part 1: OTC Cold Products

First, we'd like to ask you some general questions about over-the-counter (OTC) cold products. Please mark and/or fill in the blank, or circle the number which best represents your response.

1. Have you ever used an OTC cold product before?

   ☐ No ☐ Yes

   If yes, how often have you used an OTC cold product in the past **six** months?

   ☐ 0 times ☐ 1- 2 times ☐ 3-4 times ☐ 5-6 times ☐ ≥ 7 times

   Please list some of the products that you've used most often for treating a cold.

   _____

2. Where do you usually buy an OTC cold product? Please **rank** the top **three** places in order of frequency (1 = 1st most often, 2 = 2nd most often, 3 = 3rd most often).

   ___ Grocery store (e.g. Sentry, Kohl's, Woodman's)
   ___ Independent community pharmacy (e.g., Mallat, Neuhauser)
   ___ Chain community pharmacy (e.g. Walgreen)
   ___ Mass merchandise (e.g Walmart, ShopKo)
   ___ HMO pharmacy (e.g. Dean, Physician Plus)
   ___ Other, specify _____

3. How **knowledgeable** do you think you are about the proper use of OTC cold products?

   [Not at all knowledgeable] 1 2 3 4 5 6 7 [Extremely knowledgeable]

4. In general, how **risky** do you think it would be for you to take OTC cold products?

   [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]

5. In general, how **safe** do you think OTC cold products are?

   [Not safe at all] 1 2 3 4 5 6 7 [Extremely safe]

6. In general, how **comfortable** are you about using OTC cold products? Please give the reason for your opinion.

   [Not at all comfortable] 1 2 3 4 5 6 7 [Extremely comfortable]

   Reason:_____

   _____

7. Other than reading the drug package label, would you look for more information (e.g. ask another person) before buying a **new** OTC cold product that you've never used before?

☐ No, I would **not** look for more information because _____

_____

☐ Yes, I would look for more information because _____

_____

8. Which source of information do you use most **often** for an OTC cold product? Please **rank** the top **three** sources of information in order of frequency (1 = 1st most often, 2 = 2nd most often, 3 = 3rd most often).

___ OTC package label
___ Family member
___ Physician
___ Reference book
___ Friend
___ Pharmacist
___ Advertising media (e.g. TV, radio, print ad)
___ Other, specify _____

9. Which source of information is most **accessible** to you? Please **rank** the top **three** sources of information in order of accessibility (1 = 1st most accessible, 2 = 2nd most accessible, 3 = 3rd most accessible).

___ OTC package label
___ Family member
___ Physician
___ Reference book
___ Friend
___ Pharmacist
___ Advertising media (e.g. TV, radio, print ad)
___ Other, specify _____

10. Which source of information would you **prefer** to use? Please **rank** the top **three** sources of information in order of preference (1 = 1st most preferred, 2 = 2nd most preferred, 3 = 3rd most preferred).

___ OTC package label
___ Family member
___ Physician
___ Reference book
___ Friend
___ Pharmacist
___ Advertising media (e.g. TV, radio, print ad)
___ Other, specify _____

11. Which source of information do you **trust** to give you the information that you need? Please **rank** the top **three** sources of information in order of the level of trust you place in them (1 = 1st most trusted, 2 = 2nd most trusted, 3 = 3rd most trusted).

___ OTC package label
___ Family member
___ Physician
___ Reference book
___ Friend
___ Pharmacist
___ Advertising media (e.g. TV, radio, print ad)
___ Other, specify _____

Part 2: Cold-Arrest

Using **Label A**  mark and/or fill in the blank, or circle the number which best represents your response.

1. How **risky** do you think it would be for you to take **Cold-Arrest**?

   [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]

2. How **safe** do you think **Cold-Arrest** is?

   [Not safe at all] 1 2 3 4 5 6 7 [Extremely safe]

3. How **comfortable** would you be about taking **Cold-Arrest**?

   [Not at all comfortable] 1 2 3 4 5 6 7 [Extremely comfortable]

4. Other than reading **Label A**, would you look for more information (e.g. ask another person) before taking **Cold-Arrest**?

   ☐ No, I would **not** look for more information because _____

   _____

   ☐ Yes, I would look for more information because _____

   _____

   If yes, which source of information would you use? Please check only **one**.

   ___ Family member
   ___ Reference book
   ___ Physician
   ___ Other, specify _____
   ___ Advertising media (e.g. TV, radio, print ad)
   ___ Pharmacist
   ___ Friend

   If yes, which source of information would you **prefer** to use? Please pick **one** from the list above and give the reason why you would prefer that source for information.

   Source: _____

   Reason: _____

   _____

5. Have you ever used an OTC cold product similar to **Cold-Arrest**?

   ☐ No ☐ Yes

Part 3: Scenario One

Please read the following scenario:

> You've come down with a cold. You have a slight fever and your nose is runny and stuffy. You think that the cold will go away on its own soon but you dislike not being able to breathe easily through your nose. **In the past when you used your friend's OTC cold medicine, you noticed that you got a red rash on your face which went away a couple of days after you stopped taking it.** So this time you've decided to buy **Cold-Arrest** rather than use your friend's OTC cold medicine.

Using **Label A**  mark and/or fill in the blank, or circle the number which best represents your response.

For Scenario One:

1. How **important** do you think it would be for you to take **Cold-Arrest**?

   [Not important at all] 1 2 3 4 5 6 7 [Extremely important]

2. How **risky** do you think it would be for you to take **Cold-Arrest**?

   [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]

   Please give the reason why you think this: _____

   _____

3. How **likely** do you think it is that you would get a **rash** from **Cold-Arrest** ?

   [Not likely at all] 1 2 3 4 5 6 7 [Extremely likely]

4. If you get a **rash** from Cold-Arrest, how **serious** do you think it would be for you?

   [Not serious at all] 1 2 3 4 5 6 7 [Extremely serious]

   Please give the reason why you think this: _____

   _____

5. Have you ever experienced a **rash** from taking an **OTC cold product**?

   ☐ No ☐ Yes

   If yes, how bad was it? _____

   What action(s) did you take to get rid of the rash?

   _____

   _____

6. Would you rather have your physician prescribe a prescription drug for you than use **Cold-Arrest**?

☐ No, I would **not** prefer to have my physician prescribe because _____

_____

☐ Yes, I would prefer to have my physician prescribe because _____

_____

7. Other than reading **Label A**, would you look for more information (for example, consult another person) before taking **Cold-Arrest**?

☐ No, I would **not** look for more information because _____

_____

☐ Yes, I would look for more information because _____

_____

If yes, which source of information would you use? Please check only **one**.

___ Family member
___ Reference book
___ Physician
___ Other, specify _____
___ Advertising media (e.g. TV, radio, print ad)
___ Pharmacist
___ Friend

If yes, which source of information would you **prefer** to use? Please pick **one** from the list above and give the reason why you would prefer that source for information.

Source: _____

Reason: _____

_____

Part 4: Scenario Two

Now, please read the following scenario:

> **You don't have any health problems except that you've got very dry and sensitive skin. After you wash your face, you always have to moisturize it because it tends to get itchy and flaky if you don't.** You've just come down with a cold. You have a slight fever and your nose is runny and stuffy. You think that the cold will go away on its own soon but you dislike not being able to breathe easily through your nose. You've decided to buy **Cold-Arrest** to treat the cold.

Using **Label A**  mark and/or fill in the blank, or circle the number which best represents your response.

For Scenario Two:

1. How **important** do you think it would be for you to take **Cold-Arrest**?

   [Not important at all] 1 2 3 4 5 6 7 [Extremely important]

2. How **risky** do you think it would be for you to take **Cold-Arrest**?

   [Not risky at all] 1 2 3 4 5 6 7 [Extremely risky]

   Please give the reason why you think this: _____

   _____

3. How **likely** do you think it is that you would experience **dry skin** from **Cold-Arrest** ?

   [Not likely at all] 1 2 3 4 5 6 7 [Extremely likely]

4. If you experience **dry skin** from Cold-Arrest, how **serious** do you think it would be for you?

   [Not serious at all] 1 2 3 4 5 6 7 [Extremely serious]

   Please give the reason why you think this: _____

   _____

5. Have you ever experienced **dry skin** from taking an **OTC cold product**?

   ☐ No ☐ Yes

   If yes, what action(s) did you take to manage the problem?

   _____

   _____

6. Would you rather have your physician prescribe a prescription drug for you than use **Cold-Arrest**?

☐ No, I would **not** prefer to have my physician prescribe because _____

_____

☐ Yes, I would prefer to have my physician prescribe because _____

_____

7. Other than reading **Label A**, would you look for more information (for example, consult another person) before taking **Cold-Arrest**?

☐ No, I would **not** look for more information because _____

_____

☐ Yes, I would look for more information because _____

_____

If yes, which source of information would you use? Please check only **one**.

___ Family member
___ Reference book
___ Physician
___ Other, specify _____
___ Advertising media (e.g. TV, radio, print ad)
___ Pharmacist
___ Friend

If yes, which source of information would you **prefer** to use? Please pick **one** from the list above and give the reason why you would prefer that source for information.

Source: _____

Reason: _____

_____

Part 5: Scenario Comparison

For each scenario please imagine that you've just come down with a cold and have a slight fever, and a runny and stuffy nose. You think that the cold will go away soon but you dislike not being able to breathe easily through your nose. So you've decided to buy **Cold-Arrest** to treat the cold yourself.

Using **Label A**  please **compare** the level of risk from taking **Cold-Arrest** in five different scenarios. Then **rank** the five scenarios in order of the level of **risk** (1 = highest risk to 5 = lowest risk).

____ **Scenario 1**

> In the past when you used your friend's OTC cold medicine (**not Cold-Arrest**), you noticed that you got **a red rash on your face which went away a couple of days after you stopped taking it**.

____ **Scenario 2**

> You don't have any diagnosed health problems. **Lately you get dizzy whenever you stand up suddenly**. You think that you could be suffering from high blood pressure because it runs in the family. You've been meaning to make an appointment with your physician about it but you just haven't got the time.

____ **Scenario 3**

> You don't have any health problems except that you've got **very dry and sensitive skin**. After you wash your face, you always have to moisturize it because it tends to get itchy and flaky if you don't.

____ **Scenario 4**

> Tonight you're going to a party with your friends. **Since you're the designated driver on the way home, you'll only drink a couple of alcoholic beverages at the party**.

____ **Scenario 5**

> You don't have any health problems except that **a month ago you had hepatitis and were hospitalized for one week**. (Note: Hepatitis is an inflammation of the liver and can affect the function of your liver.)

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Please Go to the Next Page

Part 6: Label Comparison

Please read another drug package label called **Label B** for **Cold-Arrest**. **Cold-Arrest** with **Label B** is the **same** OTC cold product as **Cold-Arrest** with **Label A**. In addition, the information on both labels are the same **except** for the part **"When Using This Product"**.

COLD-ARREST Package Label B

When Using This Product:

- marked drowsiness may occur
  - alcohol, sedatives, and tranquilizers may increase the drowsiness effect
  - use caution when driving a motor vehicle or operating machinery
  - avoid alcoholic beverages
- excitability may occur, especially in children
- do not take for fever for more than 3 days unless directed by a physician

Please compare **Label B** with **Label A**  by using the above information. Mark and/or fill in the blank with your response.

1. How **risky** do you think it would be for you to take **Cold-Arrest** after reading **Label B**?

   ☐ **More** risky to take than **Cold-Arrest** with **Label A**
   ☐ **Less** risky to take than **Cold-Arrest** with **Label A**
   ☐ **No difference** in the level of risk from taking **Cold-Arrest**
   ☐ Not sure

2. Does the information on **Label B** make it more or less **safe** for you to use **Cold-Arrest**?

   ☐ **More** safe to use than **Cold-Arrest** with **Label A**
   ☐ **Less** safe to use than **Cold-Arrest** with **Label A**
   ☐ **No difference** in the level of safety in using **Cold-Arrest**
   ☐ Not sure

   Why do you think this?

   _____

   _____

   _____

3. If you were to suffer a harmful effect from **Cold-Arrest**, using the product with which label would make the harmful effect more **serious**?

- ☐ Using **Cold-Arrest** with **Label A**
- ☐ Using **Cold-Arrest** with **Label B**
- ☐ **No difference** in the level of seriousness of the harmful effect
- ☐ Not sure

Why do you think this?

_____

_____

4. After reading **Label B**, would you look for more information?

☐ No, I would **not** look for more information because _____

_____

☐ Yes, I would look for more information because _____

_____

If yes, which source of information would you use? Please check only **one** and give the reason why you would choose that source for information.

___ Family member
___ Reference book
___ Physician
___ Other, specify _____

___ Advertising media (e.g. TV, radio, print ad)
___ Pharmacist
___ Friend

Reason: _____

_____

Part 7: Personal Information

Lastly, we want to ask you questions about yourself. Please mark and/or fill in the blank.

1. Your age is: _____ years

2. Your gender is:

   ☐ Male
   ☐ Female

3. The highest level of education that you have completed is:

   ☐ Grade School
   ☐ High School
   ☐ Technical School
   ☐ College
   ☐ Graduate School

4. Which of the following health care related experiences do you have? Please check **all** that is applicable to you.

   ☐ I am not currently studying for a degree, do not have a degree, or am not working in a health care related field.

   ☐ I am currently studying or already have a degree in a health care related field.
   Please specify field _____

   ☐ I am working or I have worked in a health care related field.
   Please specify the type of work _____ and field _____

5. In your opinion, how would you rate your own health?

   ☐ Poor
   ☐ Fair
   ☐ Good
   ☐ Very Good
   ☐ Excellent

6. Do you have any health problem(s)?

☐ No
☐ Yes

If yes, what health problem(s) do you have? _____

_____

7. In the past **one** month, have you taken any OTC drug products **other than for a cold**?

☐ No ☐ Yes

If yes, what did you take the drug product(s) for? _____

_____

8. We welcome any comments you have about this study, the use of OTC drug products, or any additional information that would be most helpful or you think should appear on the OTC package label.

_____

_____

_____

_____

_____

_____

Thank You for Your Participation!

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(Prepared by Nisa Sangasubana, R.Ph. and Joseph B. Wiederholt, Ph.D.
University of Wisconsin, Sonderegger Research Center)

APPENDIX D

Questionnaire Code Book

Item	Field Name	Coding Scheme
-	ID	Identification number assigned by treatment group 100-199 2 side effects, rash, dry skin 200-299 2 side effects, rash, dizziness 300-399 2 side effects, hepatitis, dry skin 400-499 2 side effects, hepatitis, dizziness 500-599 4 side effects, rash, dry skin 600-699 4 side effects, rash, dizziness 700-799 4 side effects, hepatitis, dry skin 800-899 4 side effects, hepatitis, dizziness
-	GROUPS	1 = pharmacy, 2 = business, 3 = MBA, 9 = missing
-	SIDEFFECT	0 = 2 side effects, 1 = 4 side effects, 9 = missing
-	SCENARIO_INFO	0 = rash scenario, 1 = hepatitis scenario, 9 = missing
-	SCENARIO_NOINFO	0 = dry skin scenario, 1 = dizziness scenario, 9 =missing
Part 1: OTC Cold Products		
1	OTC_USE	0 = no, 1 = yes, 9 = missing
	FREQ_USE	1 = 0 times, 2 = 1-2 times, 3 = 3-4 times, 4 = 5-6 times, 5 = $\geq$ 7 times, 9 = missing
2	PLACE1 (1 = 1st most often)	1 = grocery store, 2 = independent community pharmacy, 3 = chain community pharmacy, 4 = mass merchandise, 5 = HMO pharmacy, 6 = other, 9 = missing
	PLACE2 (2 = 2nd most often)	1 = grocery store, 2 = independent community pharmacy, 3 = chain community pharmacy, 4 = mass merchandise, 5 = HMO pharmacy, 6 = other, 9 = missing
	PLACE3 (3 = 3rd most often)	1 = grocery store, 2 = independent community pharmacy, 3 = chain community pharmacy, 4 = mass merchandise, 5 = HMO pharmacy, 6 = other, 9 = missing
3	KNOW	1 = 1 (not at all knowledgeable), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 =7 (extremely knowledgeable), 9 = missing
4	RISK1	1 = 1 (not risky at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely risky), 9 = missing
5	SAFE1	1 = 7 (extremely safe), 2 = 6, 3 = 5, 4 = 4, 5 = 3, 6 = 2, 7 = 1 (not safe at all), 9 = missing
6	COMF1	1 = 7 (extremely comfortable), 2 = 6, 3 = 5, 4 = 4, 5 = 3, 6 = 2, 7 = 1 (not at all comfortable), 9 = missing
7	SEARCH1	0 = no, I would **not** look for more information, 1 = yes, I would look for more information, 9 = missing
8	USE1a (1 = 1st most often)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	USE1b (2 = 2nd most often)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing

Item	Field Name	Coding Scheme
	USE1c (3 = 3rd most often)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
9	ACCESS1a (1 = 1st most accessible)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	ACCESS1b (2 = 2nd most accessible)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	ACCESS1c (3 = 3rd most accessible)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
10	PREFER1a (1 = 1st most preferred)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	PREFER1b (2 = 2nd most preferred)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	PREFER1c (3 = 3rd most preferred)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
11	TRUST1a (1 = 1st most trusted)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	TRUST1b (2 = 2nd most trusted)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	TRUST1c (3 = 3rd most trusted)	1 = OTC package label, 2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
Part 2: Cold- Arrest		
1	RISK2	1 = 1 (not risky at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely risky), 9 = missing
2	SAFE2	1 = 7 (extremely safe), 2 = 6, 3 = 5, 4 = 4, 5 = 3, 6 = 2, 7 = 1 (not safe at all), 9 = missing
3	COMF2	1 = 7 (extremely comfortable), 2 = 6, 3 = 5, 4 = 4, 5 = 3, 6 = 2, 7 = 1 (not at all comfortable), 9 = missing
4	SEARCH2	0 = no, I would **not** look for more information, 1 = yes, I would look for more information, 9 = missing
	USE2	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing

Item	Field Name	Coding Scheme
	PREFER2	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	COLD_USE	0 = no, 1 = yes, 9 = missing
Part 3: Scenario One		
1	IMP3	1 = 1 (not important at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely important), 9 = missing
2	RISK3	1 = 1 (not risky at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely risky), 9 = missing
3	PROBAB3	1 = 1 (not likely at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely likely), 9 = missing
4	SERIOUS3	1 = 1 (not serious at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely serious), 9 = missing
5	OTC_EXP3	0 = no, 1 = yes, 9 = missing
6	DOC3	0 = no, I would **not** prefer to have my physician prescribe, 1 = yes, I would prefer to have my physician prescribe
7	SEARCH3	0 = no, I would **not** look for more information, 1 = yes, I would look for more information, 9 = missing
	USE3	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
	PREFER3	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
Part 4: Scenario Two (not analyzed in this study)		
1	IMP4	1 = 1 (not important at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely important), 9 = missing
2	RISK4	1 = 1 (not risky at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely risky), 9 = missing
3	PROBAB4	1 = 1 (not likely at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely likely), 9 = missing
4	SERIOUS4	1 = 1 (not serious at all), 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7 (extremely serious), 9 = missing
5	OTC_EXP4	0 = no, 1 = yes, 9 = missing
6	DOC4	0 = no, I would **not** prefer to have my physician prescribe, 1 = yes, I would prefer to have my physician prescribe
7	SEARCH4	0 = no, I would **not** look for more information, 1 = yes, I would look for more information, 9 = missing
	USE4	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing

Item	Field Name	Coding Scheme
	PREFER4	2 = family member, 3 = physician, 4 = reference book, 5 = friend, 6 = pharmacist, 7 = advertising media, 8 = other, 9 = missing
Part 5: Scenario Comparison (not analyzed in this study)		
-	SCEN1	1 = 1 (highest risk), 2 = 2, 3 = 3, 4 = 4, 5 = 5 (lowest risk)
	SCEN2	1 = 1 (highest risk), 2 = 2, 3 = 3, 4 = 4, 5 = 5 (lowest risk)
	SCEN3	1 = 1 (highest risk), 2 = 2, 3 = 3, 4 = 4, 5 = 5 (lowest risk)
	SCEN4	1 = 1 (highest risk), 2 = 2, 3 = 3, 4 = 4, 5 = 5 (lowest risk)
	SCEN5	1 = 1 (highest risk), 2 = 2, 3 = 3, 4 = 4, 5 = 5 (lowest risk)
Part 6: Label Comparison (not analyzed in this study)		
Part 7: Personal Information		
1	AGE	number listed, 99 = missing
2	SEX	0 = male, 1 = female
3	EDU	1 = grade school, 2 = high school, 3 = technical school, 4 = college, 5 = graduate school
4	H_EXP	1 = I am not currently studying for a degree, do not have a degree, or am not working in a health care related field, 2 = I am currently studying or already have a degree in a health care related field, 3 = I am working or I have worked in a health care related field, 9 = missing
	H_EXP1	1 = I am not currently studying for a degree, do not have a degree, or am not working in a health care related field, 2 = I am currently studying or already have a degree in a health care related field, 3 = I am working or I have worked in a health care related field, 9 = missing
5	HSTATUS	1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent, 9 = missing
6	HPROBLM	0 = no, 1 = yes, 9 = missing
7	OTHER_OTC	0 = no, 1 = yes, 9 = missing