

**EFFECTS OF AGE ON PERCEIVED  
RISK OF WARNING  
LABELS**

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Master of Arts and Sciences in Psychology**

**by**

**Janet Katherine Herries  
UNIVERSITY OF DAYTON**

**Dayton, Ohio**

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**APPROVED BY:**

---

**Greg C Elvers, Ph.D.**  
**Chairperson, Thesis Committee**

---

**F. Thomas Eggemeier, Ph.D.**  
**Thesis Committee Member**

---

**Leslie A. Whitaker, Ph.D.**  
**Thesis Committee Member**

**CONCURRENCE:**

---

**F. Thomas Eggemeier, Ph.D.**  
**Chairperson, Department of Psychology**

## **ABSTRACT**

### **EFFECTS OF AGE ON PERCEIVED RISK OF WARNING LABELS**

**Herries, Janet, Katherine  
University of Dayton, 1995**

**Advisor: Dr. Greg C Elvers**

Warnings alert a person in advance of a hazard associated with a particular item or activity. Labels containing hazard statements have become the most common presentation of information regarding risks. All too often it is assumed that warnings contribute significantly to the safe and proper use of products. An important aspect of warning labels is how individuals' perception of risk and risk taking behavior are affected. This research examined the perceived risk of product warning labels in two age groups, one young and one elderly group. Common household product labels and over the counter drug labels were presented to both groups in questionnaires, and were rated in terms of familiarity, likelihood of disregarding precautions, likelihood of suffering an injury or illness resulting from a product's use, severity of a potential injury or illness, and overall perceived risk. As hypothesized, compared to younger adults, older adults reported they were more likely to take precautions, rated a potential injury or illness from using a product as more severe, and rated the overall use of products as riskier. Familiarity of products led to a counter-intuitive finding: use of less familiar products was not perceived as riskier than more familiar products' use. Contrary to the prediction, older people were less familiar with over-the-counter drugs than younger people. Reported levels of familiarity were higher for household products than for over-the-counter drugs in both age groups. Product type differences were

not revealed in any of the questions related to risk. When only household products were considered, younger people estimated the risk involved in combining the product with other household chemicals as less risky than older people, as expected. This finding creates a great challenge for all product manufacturers, especially manufacturers of cleaning agents. If possible, a balance should be struck between minimizing the potential danger involved in a product's use and over-exaggerating hazards to the extent that consumers, particularly the elderly, become overly fearful. Contrary to the prediction, the two age groups did not differ in ratings of severity of a potential injury or illness resulting from the dangerous combination of a household product with other chemicals. Younger and older people both seem to be unaware of the serious effects of fumes which are released when household chemicals are combined.

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# **CHAPTER I**

## **INTRODUCTION**

### **Statement of Problem**

Warnings are provided to inform an individual of a hazard or hazards related to a particular item or activity, specifically those hazards about which they may be unaware. For instance, a warning sign posted on an electric power saw may prevent a serious accident by alerting the operator to the importance of wearing protective goggles for safety during use (Otani, Leonard, Ashford, Bushroe, and Reeder, 1992). Similar hazards are plentiful in the daily activities and environment of all humans. However, the ability to avoid hazards is a direct result of a human's initial capability for recognizing and understanding the hazards described by warnings.

Labels containing warnings about hazards have become the most commonly used form in the presentation of information regarding risks. Labeling may include on-product messages, brochures and leaflets which accompany products, warning signs in work environments, and displays at the point-of-purchase (Viscusi and Magat, 1987). As a result, many individuals in various disciplines connected with the development and distribution of warning information are concerned with warnings.

Human factors specialists are interested in many aspects of warning labels, the most important concern being how the behavior of individuals is affected by warnings. Of

course, this interest follows the assumption that warning use does affect behavior. Criteria for successful warnings have been developed by Dorris and Purswell (1977): (1) the warning message must be received; (2) the message must be understood; (3) the individual must act in accordance with the message (p.256). Dorris and Purswell have found that warnings are frequently not heeded, the behavior which is the pivotal concern of the literature and this study. In particular, the issue of perceived risk of warning labels is reviewed here according to studies involving the disregardance of warnings and risk estimation, effectiveness factors, age differences in risk perception, and household product labels. Due to the lack of research on age differences in this domain, this research addressed the question of how age affects the perceived risk of warning labels on common household products and over-the-counter drugs.

### Disregardance of Warnings and Estimation of Risk

Warnings are often ignored by individuals either because they perceive themselves as fully aware of the extent of the hazard or because the warning is not attention-getting. Furthermore, many warnings are not appropriate to the level of risk associated with the hazard. In other situations, individuals may be completely aware of a hazard but may think no harm will come to them, or they may underestimate the severity of the possible effects, one specific behavior which the methodology of this study was directed toward.

Leonard, Hill, and Otani (1990) suggested one relevant question in the circumstances in which people feel they may not be harmed while not following the warning is whether that

belief is dependent upon the situation or related to the individuals' concept of their vulnerability or invulnerability. Invulnerable feelings may stem from experiences with hazards which were not harmful.

The investigation of how accurately individuals estimate the risks indicated through hazards has been examined by several researchers (i.e., Leonard and Hill, 1989; Dunn, 1972). One influential factor in the estimation of risk is how available the information regarding the hazard and its possible consequences is made. Factors such as individual and situational components, which have not been investigated, may also affect the estimate of risk (Leonard, et al., 1990).

Severity of the effects of the hazards, another component which the proposed study will focus on, may directly influence an individuals' estimate of risk; however, not all severe effects are given the same amount of concern. For instance, smoking and exposure to large amounts of ultraviolet rays both lead to cancer, but may not result in identical risk estimates. This idea gives rise to the question of whether or not factors such as immediacy of hazardous effects are included in subjective ratings of risk, and to the question of whether this factor is relevant to the design of warnings linked to specific hazards (Leonard et al., 1990).

Another influential component presumed to affect the likelihood of disregarding a warning is a type of egocentrism in which people think they possess greater ability to handle any problems than do others, and therefore are less at risk. Thus, the individual would be expected to rate the level of risk to himself or herself lower than the level of risk to others. This was the premise of the study performed by Leonard et al. (1990), along with the examination of common attitudes and similar estimates of risk among various hazards. The

data revealed that younger males (under the age of 30 in a sample of subjects ranging from 17 to 62 years old) believed they were less at risk than all other individuals, but not less at risk than males of the same age. This finding provides evidence for the concept that there is a tendency for individuals to think it surely won't happen to me.

Because hazard perception seems to be a critical factor in decision making, subsequent research has examined the combined effects of the severity of a possible injury or illness and the likelihood of suffering an injury or illness. The results have shown that hazard perceptions are more strongly predicted by severity of injury than by likelihood of injury (Wogalter, Desaulniers, and Brelsford, 1987). This finding does not concur with other investigations of risk perception. For example, Slovic, Fischhoff, and Lichtenstein (1979, 1980) suggest that risk perceptions are determined by a combination of severity and likelihood information. Therefore, the present study also examined risk perception (in terms of overall risk ratings) as a result of these two factors, both alone and combined.

Leonard et al. (1990) found nearly every group estimated the risks related to the hazards as less for males than for females. No age differences were revealed in tests between age groups. A factor analysis failed to provide any evidence of separate components that might account for differences in perceived level of risk. However, the varied levels of severity in their investigation is consistent with studies that have shown individuals are inclined to spend more time reading warnings and directions for items perceived as more dangerous (i.e., Wright, Creighton, and Threlfall, 1982).

Leonard et al. (1990) investigated the estimates of risk associated with different hazards and perception of risk to oneself versus others. Younger males perceived

themselves as less at risk than other groups of individuals, but not less than other young males not employed in this research. In the present study, individuals were not asked to estimate the risk of the hazards for other people. Alternatively, age differences in the present study were revealed through ratings of perceived risk to the individual alone.

### Effectiveness Factors

An extensive literature review by McCarthy, Finnegan, Krumm-Scott, and McCarthy (1984) revealed a lack of evidence of warning sign effectiveness, and Lerner (1985) has pointed out the complexity in attempting to make warnings realistic. Lerner also identified the possibility of individuals' fortunate experiences, in which individuals disregard warning information but somehow avoid hazardous consequences. These results often contradict the content of warnings and lead people to believe that warnings do not need to be heeded. Furthermore, McCarthy, Robinson, Finnegan, and Taylor (1982) noted that multiple or excessive warnings are sometimes counterproductive, as a result of the competition with one another for attention.

In spite of the possible decrease in warning label compliance, there is evidence which states that warnings are effective (i.e., Godfrey, Allender, Laughery, and Smith, 1983; Godfrey, Rothstein, and Laughery, 1985) and at the very least attract some attention, giving support to the use of warnings in this study. For instance, Wright, Creighton, and Threlfall (1982), in an attempt to determine whether or not instructions would be read, acquired subjective reports which revealed that more complex items as well as items perceived as dangerous elicited greater likelihood of reading instructions than items which did not appear

dangerous or complex. The present study also obtained subjective ratings in order to show a greater likelihood of taking precautions for products perceived as risky to use compared to products perceived as not dangerous.

Wogalter, Godfrey, Fontanelle, Desaulniers, Rothstein, and Laughery (1987) acknowledged the conclusion of the review by McCarthy, et al. (1984), but also noted that the lack of empirical evidence does not necessarily indicate that all warnings fail to be effective. Wogalter et al. (1987) utilized a different approach than McCarthy, et al. and pinpointed factors which influence warning effectiveness. In accordance with suggested design criteria (i.e., Peters, 1984; Westinghouse Corporation, 1981, cited in Wogalter et al., 1987), the first group of factors involves the message content:

- (1) **Signal word** - Warnings must contain signal words appropriate to the level of risk (i.e., Danger, Warning, Caution).
- (2) **Hazard statement** - Warnings must specify the dangers involved.
- (3) **Consequences** - Warnings must emphasize the results of failure to obey, in an effort to elicit compliant behavior.
- (4) **Instructions** - Warnings must indicate the do's and don'ts in regard to avoiding danger.

The second group of factors contains important characteristics for communicating the message:

- (5) **Attention-getting** - Warnings should not blend in with the background and should exist when and where they will be read.
- (6) **Comprehensible** - The population which is exposed to the

warnings and hazards should be able to understand them.

- (7) **Concise** - Warnings should be brief and to the point.
- (8) **Durable** - Warnings should be able to withstand wear and destructive conditions in the environment.

While the warning labels in this study met the design criteria in the first group of factors, it is debatable whether or not they were in accord with the second group of factors. The most significant criterion of the effectiveness of warnings is, however, whether the warning alters the behavior of humans (Peters, 1984). Laner and Sell (1960) performed a study to show that safety posters in a work environment can affect behavior. The safety posters directed workers to put chain slings on a crane hook while the hook was not in use, as an act of safety. During the time the posters were presented, the desired behavior increased, particularly in the shops with low ceilings where the safe act resulted in the greatest change in hazard level. Laner and Sell concluded that warnings are most effective when they are directly related to the circumstances.

Performing studies on the effectiveness of warnings on behavior such as Laner and Sell's (1960) is complex for many reasons. Observing behavior which results from the presence of warnings is labor-intensive, due to the fact that significant events occur randomly. The control of extraneous variables is also a concern; otherwise, inferences about cause-and-effect relations cannot be made. Laboratory studies, on the other hand, often lack face validity and often cannot be generalized to situations in the real world. Furthermore, developing dangerous situations which comply with ethical standards and are believable to participants becomes a challenge. Thus, divergent methodologies may be required in



research involving warnings.

Wogalter, et al. (1987) utilized many kinds of methodologies, beginning with two highly controlled lab experiments, then three rating experiments, and ending with field demonstrations. The two lab experiments developed to examine effectiveness on behavior revealed that warnings presented before instructions are more likely to elicit compliance than warnings which follow instructions. The time and accuracy measures in following instructions indicated that warnings which contain a signal word, hazard statement, consequence, and instructions produce the greatest perception of warning effectiveness. Thus, the present study utilized the same components in the presentation of the warning labels. The third rating measure used by Wogalter et al. showed that the use of informative statements which are not redundant further contribute to the perceived effectiveness of a warning. Finally, the field studies, believed to be the strongest test of the ultimate criterion of warning effectiveness, demonstrated that factors such as the cost of compliance and salience are significant as well in influencing behavior. The cost of compliance, Wogalter et al. claim, should be reduced whenever possible to require less time and effort while obeying warnings, and every attempt should be made to make a warning salient. Wogalter et al. conclude that design guidelines for warnings should be based on research which represents the use of several methodologies.

Naturalistic settings also governed the investigation of the effectiveness of warnings by Godfrey, Rothstein, and Laughery (1985). They examined compliance with warnings on a copy machine, a telephone, a water fountain, and a door, and found compliance increased when the cost (in either time or effort, or both) was low. The conclusion here, as in

Wogalter et al.'s (1987) study, was that warnings with a high cost of compliance are not as effective as warnings with a low cost of compliance. The cost of compliance was not examined in the present study, due to the nature of the methodology employed by Godfrey et al. and Wogalter et al. Estimates of risk involved during a product's use were sought in the present research, as opposed to observation of individuals' behavior while complying/not complying with warnings.

In an attempt to develop more effective warning labels, Leonard and his associates (i.e., Leonard, Karnes, Otani, and Hastings, 1987; Leonard, Matthews, and Karnes, 1986) performed parametric studies to determine the effect of different aspects of a sign on perceptions of hazards. They found that subjective ratings of risk were not affected by signal words (Danger, Warning, Caution), sign color (red or black), or sex of participants. Subjective reports of whether or not individuals would ignore the signs, however, was dependent upon the location of the sign (Leonard et al., 1986). The presence of information concerning the consequence of disregarding a sign (i.e., may cause serious injury) also affected subjective ratings of both the hazard and whether or not subjects would disregard the signs (Leonard et al., 1987), an important finding which further supports the consequence portion of the warning labels used in this study.

Effectiveness of warning labels may be influenced further by factors such as the format and organization of information. General guidelines of format and organization of warning label information, according to Viscusi and Magat (1987) are governed by three major considerations:

- (1) Decrease the cognitive time and/or effort required to find external

information, recover information which has been previously stored, and encode the new information.

- (2) Decrease the cognitive time and/or effort required in making cost-benefit tradeoffs within a specific product brand or possible alternative.
- (3) Decrease the cognitive time and/or effort required to contrast various alternative products.

Many other design guidelines proposed by Bettman, Payne and Staelin (1987) may be used to enhance greater ease of finding and encoding information on warning labels. The first involves developing salient information by utilizing different sizes of print or colors (i.e., use large type for the warning in a color which contrasts with all other printed information on the label). Secondly, and possibly more importantly, is the consistency of organization. All warning labels should be created according to a standard format which places information regarding specific factors in the same area. Desired information would be much easier to locate if, for example, individuals knew that the instructions for avoiding danger was always in the middle of a label on the right side. Furthermore, hierarchical organization which presents information in the order in which individuals are apt to use it, may facilitate more rapid processing. Desaulniers (1987) has found that warning information presented in an outline layout was read and complied with by a greater proportion of subjects than warning information in the form of a paragraph. Therefore, the realistic labels utilized in this study are presented in an outline layout just as they appear on actual products.

## **CHAPTER II**

### **AGE DIFFERENCES IN PERCEPTION OF RISK**

A question left unanswered by the studies which have been discussed thus far is how various age groups react to warning labels. Oftentimes, studies in this area fail to include a contrasting age group in the experimental procedure, due to the great availability and ease of obtaining undergraduate students for participation. Yet, there is support for the notion that older adults act more cautiously than younger adults (Botwinick, 1984). This notion stems from the fact that as older people begin to experience changes in physical, perceptual, and cognitive capacities, their susceptibility to illness and injury increases.

The increase in cautiousness with advances in age may be the result of stronger feelings of vulnerability associated with hazards than vulnerabilities of younger adults. Therefore, older individuals may perceive the act of disregarding a warning sign as more risky than younger individuals. Furthermore, older adults are likely to have had a greater amount of experiences with some items and activities than younger adults, which directly influences their perception of risk. If a person has not been punished in the past for ignoring the directions presented on warning signs, a lower sense of risk is often projected upon those items or activities (Otani et al., 1992). Conversely, if a person has been punished in the past, a sense of danger may have developed.

Otani, et al. (1992) examined age differences in risk perception and the degree to which individuals were likely to ignore warning signs. A sample of 358 participants, divided into three age groups, ranging in age from 18 to 85 years, provided ratings for 12 warning labels with regard to (1) how risky they thought it would be to disregard the warning, (2) the likelihood of disregarding the warning, and (3) familiarity with the labels. Overall, the older subjects thought it was more risky to ignore the warning labels than the younger subjects. The older adults also showed less willingness to ignore the warnings than the younger subjects. Otani, et al. noted, however, that the younger subjects were drawn from a university population, whereas the other subjects were sampled from a nonuniversity population. Hence, the age differences may have reflected discrepancies in level of education. The present study, as a result, attempted to extend the findings of Otani, et al.'s study while controlling for extreme differences in level of education through the use of a demographics questionnaire.

Otani, et al. used warning labels constructed with three levels of consequences (no, mild, or severe). In order of increasing hazard, the labels were obtained from a prescription bottle, hot canister, high noise area, toxic weed killer, pressurized spray, car battery, shallow water, insect spray, amusement park ride, toxic cleaner, radiation hazard, and electric shock. The age difference in Otani, et al.'s (1992) study was not found to be associated with all warning labels. The question remains as to why the difference was not observed with some labels. The present study addressed the question of age difference in subjective responses to warning labels on two specific types of products. In addition, this research employed two

age groups, one young and one older, as opposed to the three age groups in Otani et al.'s experiment, due to the fact that there was no observed difference in ratings between the middle and older group in their findings.

Another important finding in Otani, et al.'s study is that the information contained on the label pertaining to the consequence of disregarding the warning, in contrast to Leonard et al.'s (1987) report, did not affect the subjective ratings of risk perception. Ratings of risk in Leonard et al.'s study were higher when the labels included either severe or no consequences, but lower ratings of risk were given when mild consequences were presented. Severity of consequence was not an influential component in the investigation by Otani et al. (1992), however. Due to the mixed results regarding severity of consequence, the present study later addressed this component.

In summary, the present study followed the nature of Otani et al.'s research. However, the methodology of the present study differed somewhat from Otani et al.'s study. Age differences in risk perception of warning labels on two specific products were examined among two different groups of individuals, one young and one old group. The groups were matched on two factors, education level and gender, in order to avoid discrepancies between them. Both groups were asked to answer several questions related to familiarity and the level of risk associated with each product's use. Furthermore, information regarding the consequence of ignoring the warning was addressed, due to the contradictory findings regarding this component of risk.

## **CHAPTER III**

### **WARNINGS ON HOUSEHOLD PRODUCTS**

Household products were chosen as a type of product label in this research, due to the extreme importance of proper use by consumers who vary in their experience with chemical agents. Personal experience, as noted, is often relied upon in situations where hazards are familiar and under the individuals control (Slovic, Fischhoff, and Lichtenstein, 1980). For instance, in the use of household products such as bleach, individuals may underestimate the potential hazards unless the warnings are displayed in a prominent manner. Situations involving bleach or any other household use of chemicals which result in harmless experiences are also related to greater ease of recall and lead to lower perceptions of risk (Bettman, et al., 1987). Conversely, experiences involving bleach which led to harmful results, such as in the mixing with ammonia or other acid-based products (i.e., toilet bowl cleaners), lead to higher perceptions of risk. When bleach and other household chemicals are combined, chlorine gas forms and when inhaled, causes headaches, burning sensations in the lungs, eyes, and nose (Bettman, et al.). If fumes are strong enough, the individual may lose consciousness.

Along with varying experiences, the fact that numerous household products are reusable (i.e., toilet bowl cleaners) presents difficulty in the design of warning labels. The

dilemma is that warnings become less useful as the household products are reused.

Warnings are less practical for several reasons. First, according to Godfrey and Laughery (1984), the warning on a reusable product is less likely to draw attention and be read than a warning on a non-reusable product (cited in Rothstein, 1985). Second, a container other than the original one may hold the product; therefore, the warning no longer exists. Finally, although the original container may be present and the individual is willing to read the warning, the actual product label may no longer be intact. For these reasons, Rothstein (1985) recognized the importance of designing warnings to facilitate the acts of reading and remembering.

### Hypotheses

The present study examined age differences in risk perception of hazardous information presented in warnings. Different types of labels were investigated, namely common household product labels and over-the-counter drug labels, to reveal any distinctions related to product type. Although both types of labels were contained in the stimulus materials, this thesis contains the detailed results which pertain only to household product labels. A co-researcher closely examined the over-the-counter drug labels and reported those results in a separate thesis (Militello, 1995). Nonetheless, the following hypotheses concern the individual and interactive effects of age and product type on the subjective ratings generated by survey respondents.



Main Effects. It was predicted that these subjective ratings of the warning labels would show that the younger group of subjects exhibited an overall lower perception of risk, in accord with previous research on age discrepancies in risk perception (i.e., Otani, Leonard, Ashford, Bushroe, and Reeder, 1992). Younger people were also expected to be less likely to follow the precautions on the labels and less anticipative of a severe injury or illness resulting in the use of the product. It was predicted that younger people would be more likely to underestimate the risk in mixing the contents of the product with other household products compared to older people, and would underestimate the severity of the injury or illness if the contents were combined with other chemicals.

Estimates of risk perception were expected to vary according to product type in the subjective ratings. Drugs were anticipated to be perceived as more risky than household products for two reasons. First, warning labels on drugs usually contain unfamiliar words such as disease names and chemical names of drugs. The use of unknown terms inflates the perceived risk. Second, drugs are viewed as more risky than household products because they are generally ingested. People experience unpleasant symptoms (i.e., food poisoning, excessive alcohol consumption, drug allergies, food allergies) more frequently as a result of consuming things than as a result of inhaling fumes or skin contact.

All subjects were expected to express a greater level of confidence in their understanding of the hazards pertaining to household products than drugs, and an overall lower perception of risk for household products compared to drugs was predicted. Warning labels of household products were expected to be judged as more exaggerated than those of drugs, and the disregardance of precautions on household products was expected to be

viewed as lower in terms of riskiness than drugs. The likelihood of following precautions on the label was anticipated to be lower with household products than with drugs. Household products were also expected to be perceived as inducing less severe injuries and illnesses than drugs.

Interactions. An age by product type interaction was predicted. The older group was expected to be more familiar with drug labels than the younger group, but the groups were expected to be equally familiar with household products. Therefore, a greater discrepancy in risk estimates associated with product type was predicted for the younger people than for the older people. No other interactions were expected.

## **CHAPTER IV**

### **METHOD**

#### **Subjects**

Ninety-six adults were divided into 2 age groups: young (17-29) and old (65-89). The mean ages for the young and old groups were 20 years and 75 years, respectively. Subjects in the young group were obtained from the subject pool at the University of Dayton, and consisted of students enrolled in introductory psychology courses and from within the community. Students received research participation credit in partial fulfillment of the requirements for an introductory psychology course. Subjects in the older group were obtained from several local senior citizens groups including: The Senior Citizens' Center in Kettering, the Senior Citizens Community Center in Dayton, Seniors, Inc. in Centerville, and the Christ United Methodist Church in Kettering. The use of subjects was in accord with the University of Dayton Psychology Department Policy and Procedures for Conducting Research and the Use of Human Subjects.

The two age groups were matched on gender and education level. Each group contained 35 females and 13 males. Each age group contained 23 individuals with thirteen to seventeen years of school (mean = 15), which included college level education; and 25 individuals who completed ten to twelve years of school (mean = 11.8), but no college level education. (A t-test revealed significant differences between subjects (young and old) with

college level education (mean = 14.98) and subjects (young and old) without college level of education (mean = 11.86),  $p < .0005$ . Thus, people without college level education did differ significantly in the number of years of education from people with college level education.)

### Materials and Procedure

Before the experiment began, all subjects were asked to read and sign an informed consent form (Appendix A) and complete a demographics questionnaire (Appendix B). The questionnaire booklet consisted of 2 sets of 8 warning labels (Appendix D). One set contained warning labels from a variety of common household products. The other set consisted of warning labels from over-the-counter drugs. The warning labels were verbatim reproductions of actual product labels. All labels were presented in black and white and were printed in Geneva 12-point font, which is slightly larger than the print on most warning labels. In order to ensure that all subjects were able to read the warning labels as presented, realism was sacrificed for readability. These items were presented in a booklet in one of two orders. In the first order, the drug label set was presented first; in the second order, the household product label set was presented first. Within each set the items were ordered randomly. Half the subjects in each age group received the first order and half the subjects received the second order.

Stapled to the front of the booklet was a one-page instruction sheet. At the top of each of the following pages was a phrase describing the product or drug and a sentence

describing its use. Below this description was a label, followed by 7 questions. Each question was accompanied by a 7-point rating scale. Verbal labels were used to anchor the ends and midpoint of each scale. The first five questions were the same regardless of label set. These questions addressed product familiarity, likelihood of taking precautions listed on label, likelihood of suffering an injury/illness from product's use, severity of a potential injury/illness, and overall level of risk. The last two questions pertained specifically to the label set being evaluated (either household cleaners or drugs) and addressed the risk involved when the product is used improperly, and the severity of a potential injury/illness resulting from improper use. These questions were chosen because of their frequent use and reliability in previous studies of risk perception and consumer products.

The questionnaire was administered in small groups ranging from 3 to 16 individuals or individually. Once the group had assembled and completed the informed consent forms and demographics questionnaire, the investigators distributed the booklets randomly to the group. Investigators provided writing utensils. One investigator read the instructions (Appendix C) and answered any questions. When all questions had been answered to the subjects' satisfaction, the experimenter indicated that the subjects could begin filling out the questionnaire booklet. During the administration of the booklet, an investigator was present to answer any questions that arose. Most subjects finished completing the questionnaires within 45-50 minutes. After each subject finished the questionnaire, an investigator administered the form containing a checklist of factors which influenced their ratings of the questions (Appendix E), and the debriefing materials (Appendix F). The data of four older subjects and one younger subject, who were not able to complete the survey within the

**allotted time (60 minutes), or whose data were found to be incomplete, were discarded.**

## CHAPTER V

### RESULTS

The effects of three independent variables, age, product type, and order of questions on ratings of perceived risk in warning labels were studied. A 2 (age) x 2 (product type) x 2 (order) mixed design analysis of variance was conducted for each of the seven questions. Age (young; older) and order of questionnaires (over-the-counter drugs presented first; household products presented first) were between-subjects variables; product type (over-the-counter drugs; household products) was a within-subjects variable. The dependent variable was the mean ratings generated in response to each question, collapsed across each of the eight warning labels for each of the two product types.

There was no reason to believe that there would be an order effect. However, the two different orders of questionnaires did influence the ratings provided by the respondents. The interaction of age and order for question 3 was significant ( $F(1,92) = 6.29, p=.01, MS_{\text{error}} = 2.183$ ). Younger people who had completed the over-the-counter drugs questionnaire first tended to rate the likelihood of suffering an injury or illness resulting from a product's use to be lower than younger people who had completed the household product questionnaire first. Conversely, older people who had completed the over-the-counter drugs questionnaire first tended to rate the likelihood of suffering an injury or illness, resulting from a product's use, higher than older people who had completed the household products questionnaire first.

A significant interaction of age and order occurred in the responses to question 5, as well ( $F(1,92) = 8.55, p < .005, MS_{\text{error}} = 1.622$ ). Younger respondents of over-the-counter drugs first surveys perceived the riskiness of using products as lower than younger respondents of household products first surveys. Older respondents of over-the-counter drugs first surveys, however, perceived the riskiness of using products as higher than older respondents of household products first surveys. Furthermore, a significant main effect of order occurred in question 1 ( $F(1,92) = 6.85, p = .01$ ). Lower ratings of product familiarity were given for over-the-counter drugs first questionnaires than household products first questionnaires.

As a result of the strong influence of order on the ratings of warning labels, the data set was reduced. One-half of each subject's data was discarded. The data of respondents of over-the-counter drugs first questionnaires became restricted to ratings of over-the-counter drugs only; and the data of respondents of household products first questionnaires became limited to ratings of household products only. Thus, product type became a between-subjects variable in the analyses of variance performed with the smaller data set. A 2 (age) x 2 (product type) between-subjects analysis of variance was conducted for each of the seven questions. The dependent variable was the mean ratings generated in response to each question, collapsed across each of the eight warning labels for each of the two product types, as shown in Table 1. Table 2 shows the mean ratings of familiarity and perceived risk by age group, collapsed further over both product types. Analyses of simple effects were conducted for interactions that were found to be significant. Appendix G contains the ANOVA summary tables.



**Main Effects.** A significant main effect of age was revealed in the ratings of familiarity (question 1) ( $F(1,92) = 5.80, p=.02, MS_{\text{error}} = 1.101$ ). Contrary to the prediction, younger people reported being more familiar with both household products and over-the-counter drugs (mean = 4.89) than older people reported (mean = 4.37). The main effect of age in ratings of likelihood of taking precautions listed on the labels (question 2) was also significant ( $F(1,92) = 5.88, p=.02, MS_{\text{error}} = 1.245$ ). Older people (mean = 6.03) reported being more likely to follow the precautions listed on the product labels than younger people reported (mean = 5.48), as predicted. Contrary to the prediction, the main effect of age (mean<sub>young</sub> = 2.85, mean<sub>old</sub> = 3.20) in ratings of likelihood of suffering an injury or illness (question 3) was not significant ( $F(1,92) = 2.30, p=.13, MS_{\text{error}} = 1.253$ ).

For question 4, the main effect of age on ratings of predicted severity of an injury or illness resulting from the use of the product was significant ( $F(1,92) = 4.27, p=.04, MS_{\text{error}} = 1.346$ ). Older people (mean = 4.35) believed that the severity of a possible injury or illness resulting from the use of household products and over-the-counter drugs would be higher than younger people believed (mean = 3.86), as predicted. A significant main effect of age was also revealed in the overall rating of risk involved when using the products (question 5) ( $F(1,92) = 18.01, p<.0005, MS_{\text{error}} = 1.043$ ). As hypothesized, older people (mean = 3.31) thought it was more risky to use household products and over-the-counter drugs than younger people (mean = 2.77).

Table1: Mean Ratings of Familiarity and Perceived Risk

	<u>Over-the-Counter Drugs</u>		<u>Household Products</u>	
	Young	Old	Young	Old
Q1: Product Familiarity	4.24	3.52	5.55	5.24
Q2: Likelihood of Taking Precautions	5.43	5.71	5.53	6.35
Q3: Likelihood of Suffering An Injury/Illness	2.51	3.66	3.19	2.74
Q4: Severity of Potential Injury/Illness	3.66	4.41	4.06	4.29
Q5: Overall Risk	2.41	3.83	3.13	2.78

**Table 2: Mean Ratings of Familiarity and Perceived Risk by Age Group**

	Young	Old
Q1: Level of Familiarity	4.89	4.38*
Q2: Likelihood of Taking Precautions	5.48	6.03*
Q3: Likelihood of Suffering Injury/Illness	2.85	3.20
Q4: Severity of Potential Injury/Illness	3.86	4.35*
Q5: Overall Risk	2.77	3.31*

\*Indicates a statistically significant difference between ratings ( $p < .05$ ).

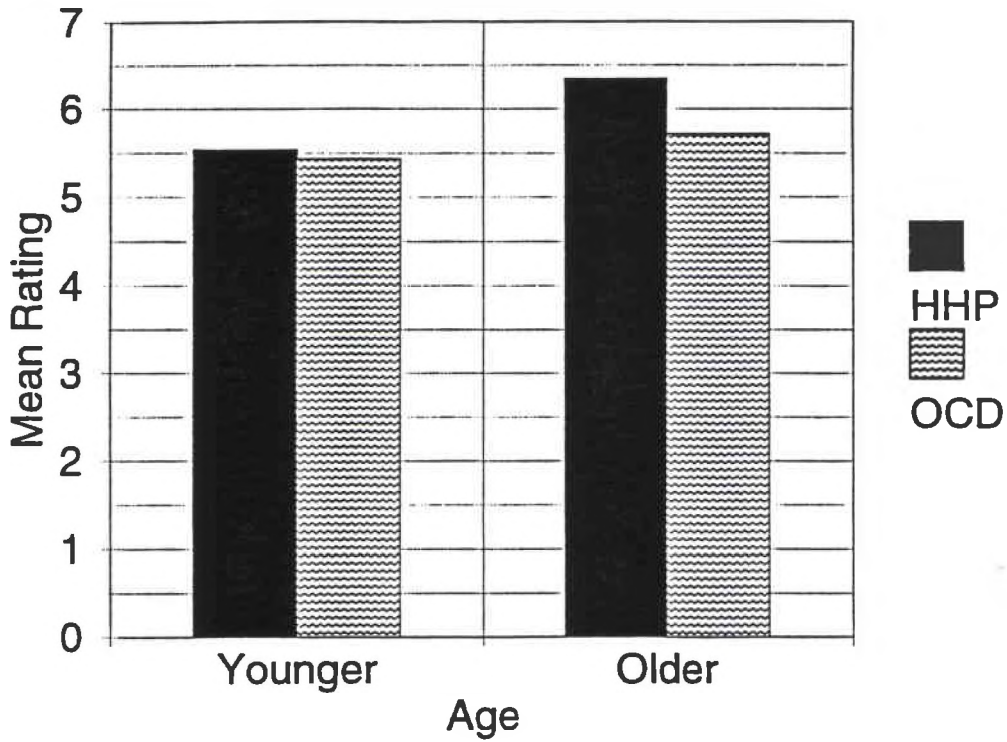


Figure 1. Mean Ratings of Likelihood of Suffering an Injury/Illness as a Function of Age Group and Product Type.

A significant main effect of product type on ratings of familiarity (question 1) was revealed ( $F(1,92) = 50.43, p < .0005$ ). Contrary to the prediction, the level of familiarity was higher for household product labels (mean = 5.40) than for over-the-counter drug labels (mean = 3.88). Also contrary to the prediction, the main effect of product type (mean<sub>household</sub> = 5.94, mean<sub>drugs</sub> = 5.57) on the likelihood of taking precautions on the warning label (question 2) was not significant ( $F(1,92) = 2.64, p = .108$ ).

The main effects of product type on ratings of likelihood of suffering an injury or illness (question 3) (mean<sub>household</sub> = 2.97, mean<sub>drugs</sub> = 3.08) and ratings of estimated severity of the injury or illness (question 4) (mean<sub>household</sub> = 4.18, mean<sub>drugs</sub> = 4.03) were not significant ( $F(1,92) = .26, p = .61, F(1,92) = .38, p = .54$ , respectively), both contrary to predictions. Furthermore, the main effect of product type (mean<sub>household</sub> = 2.95, mean<sub>drugs</sub> = 3.12) on ratings of overall risk (question 5) was not significant ( $F(1,92) = .68, p = .41$ ), contrary to the prediction.

Interactions. The interaction of age and product type (mean<sub>old, household</sub> = 5.24, mean<sub>old, drugs</sub> = 3.52; mean<sub>young, household</sub> = 5.55, mean<sub>young, drugs</sub> = 4.24) on ratings of familiarity (question 1) was not significant ( $F(1,92) = .90, p = .35$ ), contrary to the prediction. A significant interaction of age and product type was revealed in the ratings of likelihood of suffering an injury or illness (question 3). Younger people rated the likelihood of suffering a possible injury or illness resulting from the use of a product as more probable for household products than for over-the-counter drugs (mean<sub>young, household</sub> = 5.53, mean<sub>young, drugs</sub> = 5.43) ( $F(1,46) = 5.53, p = .02$ ). Conversely, older people rated the likelihood of suffering a possible injury or illness resulting from the use of a product as more probable for over-the-counter drugs than

for household products ( $\text{mean}_{\text{old, household}} = 6.35$ ,  $\text{mean}_{\text{old, drugs}} = 5.71$ ) ( $F(1,46) = 6.74$ ,  $p=.01$ ).

This interaction is shown in Figure 1.

The interaction of age and product type on ratings of overall risk when a product is used (question 5) was significant ( $F(1,92) = 18.01$ ,  $p<.0005$ ). Younger people perceived household products as more risky to use than over-the-counter drugs ( $\text{mean}_{\text{young, household}} = 3.13$ ,  $\text{mean}_{\text{young, drugs}} = 2.41$ ) ( $F(1,46) = 8.04$ ,  $p=.007$ ), whereas older people believed over-the-counter drugs to be more risky to use than household products ( $\text{mean}_{\text{old, household}} = 2.78$ ,  $\text{mean}_{\text{old, drugs}} = 3.83$ ) ( $F(1,46) = 10.10$ ,  $p=.003$ ). This interaction is graphed in Figure 2.

Household Products. For question 6, the main effect of age on ratings of estimated risk was significant ( $F(1,46) = 5.53$ ,  $p=.02$ ,  $MS_{\text{error}} = .648$ ). Younger people estimated the risk involved in mixing the contents of a household product with other household chemicals as less risky than older people, as predicted. Contrary to the prediction, the main effect of age on ratings of estimated severity of an injury or illness (question 7) was not significant ( $F(1,46) = 3.32$ ,  $p=.08$ ,  $MS_{\text{error}} = .922$ ). Table 3 contains the mean ratings for household product labels.

Correlations and Regressions. Pearson correlations were computed among the questions to understand the relationships among the measures. Reliable correlations were found between the likelihood of suffering an injury or illness from using the product (question 3) and severity of a potential injury or illness (question 4) ( $r = .64$ ,  $p<.0005$ ), the likelihood of suffering an injury or illness from using the product (question 3) and overall perceived risk (question 5) ( $r = .77$ ,  $p<.0005$ ), and severity of the injury or illness (question 4) and overall perceived risk (question 5) ( $r = .61$ ,  $p<.0005$ ). These questions were expected

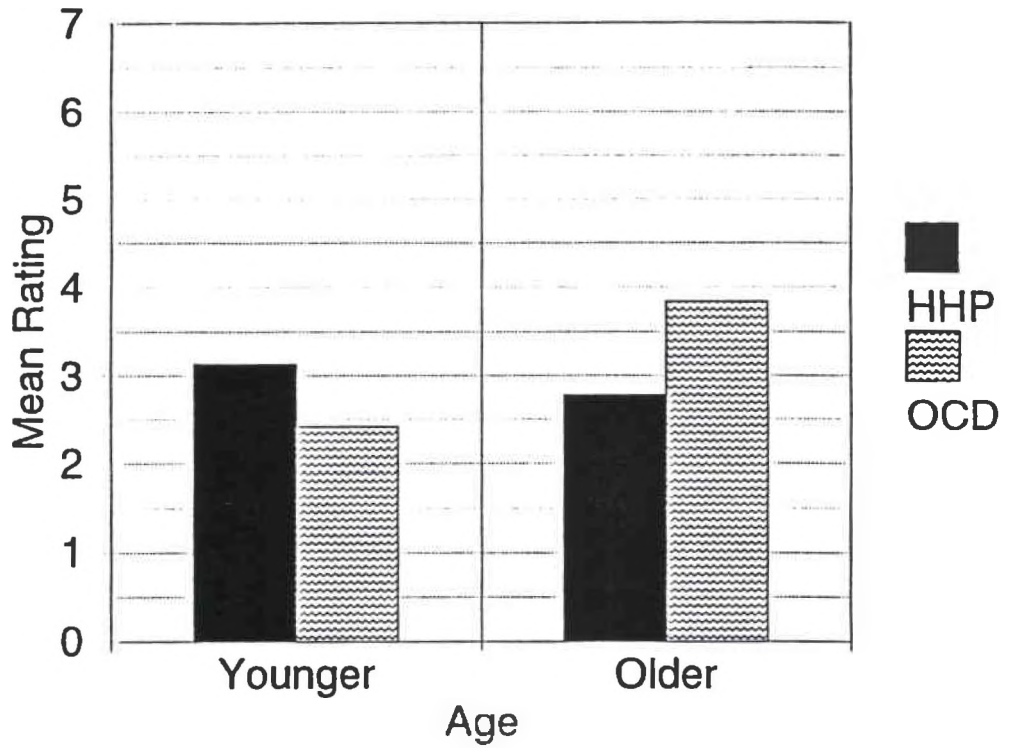


Figure 2. Mean Ratings of Overall Risk as a Function of Age Group and Product Type.

**Table 3: Mean Ratings of Perceived Risk in Improper Use of Household Products**

	Young	Old
<b>Q6: Risk of Improper Product Use</b>	5.48	6.04
<b>Q7: Severity of Consequences of Improper Product Use</b>	5.22	5.74



to be highly intercorrelated, due to the fact that they all address components of risk, namely likelihood of suffering an injury or illness from using the product (question 3), severity of the injury or illness (question 4), and overall riskiness(question 5).

Through a multiple regression, ratings of the likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) predicted ratings of overall risk (question 5). The likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) accounted for 61.4% of the variance of mean ratings of overall risk ( $R^2 = .61$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness (question 3) uniquely contributed 23.7% to the variation in overall risk ratings, and the severity of a injury or illness resulting from a product's use uniquely accounted for 2.7% of the variance in mean ratings of risk. Thus, questions 3 and 4 overlapped 35% in accounting for the variance in risk ratings.

A multiple regression was calculated using only the younger group's ratings of the likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) to predict mean ratings of overall perceived risk (question 5). The combined effects of these questions accounted for 65.5% of the variance in mean ratings of risk ( $R^2 = .656$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness (question 3) uniquely contributed 34% to the variation in overall risk ratings, the severity of an injury or illness resulting from a product's use uniquely accounted for 0% of the variance in mean ratings of risk. Thus, questions 3 and 4 overlapped 31.6% in accounting for the variance in risk ratings.

A multiple regression was also calculated using only the older group's ratings of the likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) to predict mean ratings of overall perceived risk (question 5). The combined effects of these questions accounted for 58.5% of the variance in mean ratings of risk ( $R^2 = .585$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness (question 3) uniquely contributed 21% to the variation in overall risk ratings, and the severity of a injury or illness resulting from a product's use uniquely accounted for 4.7% of the variance in mean ratings of risk. Thus, questions 3 and 4 overlapped 32.8% in accounting for the variance in risk ratings.

Correlations were also calculated for questions 3, 4, and 5 in ratings of household product warning labels only. Again, reliable correlations were found between questions 3 and 4 ( $r = .50$ ,  $p < .0005$ ), questions 3 and 5 ( $r = .67$ ,  $p < .0005$ ), and questions 4 and 5 ( $r = .46$ ,  $p < .002$ ).

A multiple regression involving the likelihood of suffering an injury or illness resulting from using a product (question 3) and the severity of an injury or illness (question 4) was performed to predict ratings of overall risk (question 5), using only responses to household product labels. Question 3 and question 4 together accounted for 59.9% of the variance of mean ratings of overall risk ( $R^2 = .599$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness resulting from a product's use (question 3) uniquely contributed 28.3% to the variation in mean ratings of risk. The severity of a possible injury or illness uniquely accounted for 2.4% of the variance in mean ratings of overall risk. Questions 3 and 4 shared 29.2% in overlapped variability of the mean ratings of risk.

A multiple regression was also calculated using only the younger group's ratings of household products pertaining to the likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) to predict overall perceived risk (question 5). The combined effects of these questions accounted for 65.2% of the variance in mean ratings of perceived risk ( $R^2 = .652$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness (question 3) uniquely contributed 43.7% to the variance in overall risk ratings, and the severity of a potential injury or illness (question 4) uniquely accounted for .1% of the variance in mean ratings of risk. These questions overlapped 21.4% in accounting for the variance in risk ratings.

Another multiple regression was calculated using only the older group's household product ratings of the likelihood of suffering an injury or illness resulting from a product's use (question 3) and severity of a possible injury or illness (question 4) to predict overall perceived risk (question 5). The combined effects of these questions accounted for 59.2% of the variance in mean ratings of perceived risk ( $R^2 = .592$ ,  $p < .0005$ ). The likelihood of suffering an injury or illness (question 3) uniquely contributed 25.2% to the variance in overall risk ratings, and the severity of a potential injury or illness (question 4) uniquely accounted for 3.2% of the variance in mean ratings of risk. These questions overlapped 30.8% in accounting for the variance in risk ratings.

In addition, correlations between the risk involved when the contents of a household product are mixed with other chemicals (question 6) and the severity of a resulting injury or illness resulting from combining the product with other household chemicals (question 7) were performed. These questions were expected to be highly correlated, as they both

address the perilous act of combining the household product with other chemical agents. A reliable correlation was found between questions 6 and 7 ( $r = .79$ ,  $p < .0005$ ), but not between questions 5 and 6 ( $r = .17$ ,  $p = .25$ ) or between questions 5 and 7 ( $r = .24$ ,  $p = .11$ ).

Through a multiple regression, ratings of risk if the contents of a household product were mixed with other household chemicals (question 6) and ratings of severity of an injury or illness resulting from combining the product with other chemicals (question 7) predicted mean ratings of overall risk (question 5). Together, questions 6 and 7 accounted for 12.6% of the variance in mean ratings of overall risk ( $R^2 = .126$ ,  $p < .003$ ). The risk involved in mixing the contents of a product with other chemicals (question 6) uniquely contributed .9% to the variation in ratings of risk. The severity of an injury or illness resulting from combining the product's contents with other chemicals (question 7) uniquely accounted for 1.8% of the variance in overall risk ratings. Questions 6 and 7 overlapped 9.9% in their contribution to the variance of ratings of overall risk.

A multiple regression was calculated using only the younger group's ratings of risk if the contents of a household product were mixed with other household chemicals (question 6) and ratings of severity of an injury or illness resulting from combining the product with other chemicals (question 7) to predict mean ratings of overall risk (question 5). The combined effects of these questions were in the same direction as the above regression, but did not reach significance ( $R^2 = .112$ ,  $p = .07$ ).

Furthermore, a multiple regression was calculated using only the older group's ratings of risk if the contents of a household product were mixed with other household chemicals (question 6) and ratings of severity of an injury or illness resulting from combining the

product with other chemicals (question 7) to predict mean ratings of overall risk (question 5). The combined effects of these questions were in the same direction as the regression of both age groups, but did not reach significance ( $R^2 = .117$ ,  $p=.06$ ).

**Influential Factors of Perceived Risk.** Respondents reported which of seven factors influenced their ratings of perceived risk in the warning labels: (1) length of warning label; (2) unfamiliar words in warning labels; (3) chemical names in warning labels; (4) typical use of product (i.e., swallowed vs. external use); (5) ease of compliance with precautions listed on labels; (6) severity of consequences resulting from improper use of product; and (7) likelihood of injury or illness resulting from product's use. Chi-square tests of independence were performed for each factor to determine which factors influenced the ratings of perceived risk. A significant difference between age groups was found when unfamiliar words appeared in warning labels ( $X^2(1) = 4.36$ ,  $p=.04$ ). Twenty-one percent of older people reported that unfamiliar words affected their responses to warnings on product labels, whereas only 6% of younger people reported so. No other statistically significant differences between age groups were revealed. Table 3 contains the seven influential factors of perceived risk and their reported frequencies.

The factors which had the strongest influence on ratings of perceived risk were: severity of consequences resulting from improper use of product (84% reported); likelihood of injury or illness resulting from use of product (70% reported); and typical use of product (44% reported).

Table 4: Influential Factors of Perceived Risk.

	<u>Older</u>	<u>Younger</u>	<u>Total</u>
	N=48	N=48	N=96
Length of Warning Label	27%	23%	25%
Unfamiliar Words	21%	6% *	14%
Chemical Names	31%	50%	41%
Typical Use	42%	46%	44%
Ease of Compliance With Precautions	29%	27%	28%
Severity of Consequences from Improper Use	83%	85%	84%
Likelihood of Injury or Illness	69%	71%	70%

\*Indicates a statistically significant difference between ratings ( $p < .05$ ).

## CHAPTER VI

### DISCUSSION

#### Age Differences

**Familiarity.** Age differences were predicted in familiarity, perception of risk and risk-taking behavior as indicated by self-ratings on questions 1 through 5. Younger people reported higher levels of familiarity with both over-the-counter drugs and household products than older people. The older group was expected to rate the drugs as more familiar than the younger group. The rationale for this prediction was that older people tend to take more drugs than younger people, due to the changes in physical conditions which accompany aging. It appears, however, that older people do not use many over-the-counter drugs; instead prescription drugs may usually be relied upon. In fact, the demographic information showed that among the forty-eight older people in this study, thirty-four take prescription drugs, four take over-the-counter drugs, four take both prescription and over-the-counter drugs, and five do not consume either. Therefore, the majority of the older people, who consume prescription drugs only, may not be as familiar with the recent expansion in over-the-counter drugs and their warning labels.

A similar explanation can be applied to the finding regarding household products.

No difference between age groups was expected in familiarity ratings for household products. The finding that younger people are more familiar with household products suggests that this age group may attend to sales advertisements when choosing cleaning products and may purchase different types of household products more frequently. Conversely, older people may be loyal to only a few standard cleaning agents, not becoming familiar with other products.

Risk. With the exception of one question, all subjective ratings indicated that older adults are more cautious than younger adults, as predicted. Older people were more likely to take precautions listed on the warning label, rated a potential injury or illness resulting from a product's use as more severe, rated the use of the products as riskier, and rated the improper use of products as riskier. Ratings of the likelihood of suffering an injury or illness as a result of using a product were not significantly higher for the older group than the younger people. The tendency in mean ratings was in the predicted direction (older group = 3.198, younger group = 2.580), but did not reach significance ( $F(1,92) = 2.295, p < .133$ ). These age differences are consistent with other findings in studies of risk perception (Botwinick, 1984; Otani, Leonard, Ashford, Bushroe, and Reeder, 1992). Older people begin to experience changes in physical, perceptual, and cognitive capacities as they age, thus increasing their susceptibility to illness and injury. Stronger feelings of vulnerability may then lead to an intensified perception of risk.



## Product Type Differences

**Familiarity.** Reported levels of familiarity were higher for household product labels than for over-the-counter drug labels. No prediction was made for this comparison, but the result is not surprising. The participants in this study rated themselves as having good or excellent health in the demographics survey, possibly indicating a lack of need for over-the-counter drugs. Furthermore, people may not tend to use over-the-counter drugs on a routine basis as they do cleaning agents.

**Risk** Estimates of risk perception and risk-taking behavior were expected to differ according to product type. It was predicted that drugs would be perceived as more risky than household products. The reasons for the prediction were twofold. First, drug warning labels typically include unfamiliar words such as disease names and chemical names of drugs. The use of unfamiliar terms was believed to inflate the perceived risk. Second, drugs could be perceived as more risky than household products because they are generally ingested. People are more likely to have experienced unpleasant symptoms as a result of ingesting things (food poisoning, excessive alcohol consumption, spicy foods, food allergies, drug allergies, etc.) than as a result of breathing fumes or dermal contact.

Results relating risk perception across product type did not display the predicted effect. Product type differences were not significant for any of the questions relating to risk. This suggests that over-the-counter drugs are not considered any riskier than household products, in spite of the fact that they are typically ingested. This finding was surprising and inconsistent with the finding that respondents were less familiar with over-the-counter drugs than household products. Lack of familiarity with products usually leads to increased levels

of perceived risk (Desaulniers, 1989); yet, this notion was not supported in ratings of risk for drugs. Otani, Leonard, Ashford, Bushroe, and Reeder (1992) witnessed this counter-intuitive effect of familiarity in ratings of perceived risk as well. It is possible that familiarity of the stimulus materials did not differ enough in the present study or in the scenarios used by Otani, et al. to replicate Desaulniers' finding. The question warrants further investigation.

Interactions. An age by product type interaction for level of familiarity was predicted. Desaulniers (1989) showed that more commonly used, familiar products are rated as less hazardous than products that are encountered infrequently. Older people were expected to be more familiar with drug labels than younger people, yet both groups were expected to be equally familiar with household products. It was thus hypothesized that there would be a greater disparity in risk estimates relating to product type for the younger group than for the older group. However, the interaction effect was not significant. This finding was not surprising, due to the fact that the younger group was more familiar with both over-the-counter drugs and household products than the older group.

No other interactions were predicted, yet significant effects in ratings of likelihood of suffering an injury or illness resulting from a product's use (question 3) and ratings of overall perceived risk (question 5) were found. The tendency in subjective ratings for both questions displayed a common pattern. Younger people estimated the likelihood of suffering an injury or illness and the overall risk as more probable and more risky for household products than for over-the-counter drugs. Conversely, older people thought the likelihood

of suffering an injury or illness and the overall risk would be more probable and more risky for over-the-counter drugs than for household products. A potential explanation could be that younger people have grown up during an era of heightened ecological awareness, in terms of knowledge pertaining to consequences of exposure to dangerous fumes, and have shown greater concern in their ratings of household product labels. Older people, however, may not have been as attentive to the effects of organic solvents and chemicals in their environment. Instead, they have displayed greater cautiousness for the effects of consuming unfamiliar products in their ratings of over-the-counter drugs (See Table 2).

Household Products. Respondents who rated warning labels of household products were asked to estimate the risk involved if the product's contents were combined with other household chemicals (question 6), and the severity of a potential injury or illness resulting from that combination (question 7). Younger people had smaller estimates of risk in mixing the contents of the product with other household chemicals compared to older people, as expected. This result provides support for the finding that younger adults are usually less cautious and often disregard instructions (Otani, Leonard, Ashford, Bushroe, and Reeder, 1992). Younger people were also expected to estimate the severity of the injury or illness if the contents were combined with other chemicals as less severe than older people. However, an age difference was not found in the ratings of severity of a potential injury or illness. It appears that both age groups are not fully aware of how the fumes released from the dangerous combination of household chemicals can affect them, or how serious the effects can be.

Predictors of Risk. Correlation results showed that the likelihood of suffering an injury or illness after using a product (question 3), the severity of a potential injury or illness (question 4), and overall ratings of risk (question 5) are highly correlated, as expected. The combined effects of the likelihood of suffering an injury or illness resulting from a product's use and the severity of a potential injury or illness accounted for only 61.4% of the variability in the mean ratings of overall risk. This indicates that other factors, such as situational and individual experiences involved with different products and frequency of use of the two product types, also influenced perceived risk. In spite of the fact that there was a fairly large amount of overlap in the contribution to variability in ratings of overall risk, it is apparent that the likelihood of suffering an injury or illness resulting from a product's use is a stronger predictor than the potential severity of an injury or illness.

The younger group's ratings of the likelihood of suffering an injury or illness as a result of a product's use and the severity of a potential injury or illness accounted for 65.5% of the variance in mean ratings of overall risk. Alone, the severity of a potential injury or illness did not contribute at all to the variation in overall risk. Yet, the two questions shared a fair amount of overlap in accounting for the variance in risk ratings. This result is not surprising, considering the significant age difference in regard to the severity of a potential injury or illness, in which younger people estimated the severity as less than somewhat severe. It appears that this component of risk is not influential in younger adults' perceptions of risk.

The older group's ratings of the likelihood of suffering an injury or illness as a result of a product's use and the severity of a potential injury or illness accounted for 58.5% of the

variance in mean ratings of overall risk. Compared to the younger people, a slightly smaller amount of variance in overall risk ratings is due to the likelihood of suffering an injury or illness alone. Unlike the younger group, the older group was influenced by the severity of a potential injury or illness in their overall perceived risk, albeit a small amount.

When only household product labels were considered, the likelihood of suffering an injury or illness after using a product (question 3), the severity of a potential injury or illness (question 4), and overall ratings of risk (question 5) were also strongly related. Together, the likelihood of suffering an injury or illness resulting from a product's use and the severity of a potential injury or illness only accounted for 59.9% of the variability in mean ratings of overall risk. Again, other factors such as individual and situational components had an apparent bearing upon perceived risk. Although a fair amount of variance was shared among the likelihood of suffering an injury or illness and the severity of a potential injury or illness in ratings of overall risk, it is obvious that the likelihood of suffering an injury or illness resulting from a product's use is a stronger predictor than the potential severity of an injury or illness when only household products are accounted for.

The younger group's ratings of the likelihood of suffering an injury or illness after using a household product and the severity of a potential injury or illness accounted for 65.2% of the variance in overall risk ratings. Although a fair amount of variability was shared among the likelihood of suffering an injury or illness and its severity in ratings of overall risk, it is clear that the likelihood of suffering an injury or illness resulting from the use of a household product is a much stronger predictor than the potential severity among younger people.

Older adults' ratings of the likelihood of suffering an injury or illness after using a household product and the severity of a potential injury or illness accounted for 59.2% of the variance in overall risk ratings. As with the younger group, even though these components shared a considerable amount of overlap in the variance of overall risk ratings, the likelihood of suffering an injury or illness resulting from the use of a household product is a much stronger predictor than the potential severity among older people.

Overall, the relationships between the likelihood of suffering an injury or illness, the severity of a potential injury or illness, and ratings of overall risk followed a different pattern than that suggested by Slovic, Fischhoff, and Lichtenstein (1979, 1980). They had stated that risk perception seemed to be a combined result of the likelihood of suffering an injury or illness and the severity of a potential injury or illness. However, in the present study, the likelihood of suffering an injury or illness was a much stronger predictor of overall risk ratings than the severity of a potential injury or illness. This result also disagrees with the findings of Wogalter, Desaulniers, and Brelsford (1987). They suggested that the severity of an injury or illness would predict risk perceptions more strongly than the likelihood of suffering an injury or illness.

The relationships between the risk involved if the contents of a cleaning product were mixed with other household chemicals (question 6) and the severity of a potential injury or illness resulting from combining the product with other chemicals (question 7) was quite strong. However, these two components were not significantly related to ratings of overall perceived risk (question 5).

Ratings of risk involved if the contents of a household product were combined with

other chemicals and the severity of a potential injury or illness accounted for 12.6% of the variability in mean ratings of overall perceived risk. These components overlapped a fair amount in their contribution to overall risk ratings; however, the severity of an injury or illness resulting from combining the product's contents with other chemicals was slightly more influential on overall perceived risk.

When each age group was examined alone, their ratings of risk involved if the contents of a household product were combined with other chemicals and the severity of a potential injury or illness did not predict overall ratings of perceived risk. The combined effects of these components in each age group were in the same direction as the result for both age groups as described above, but did not reach significance.

Lastly, other factors which influenced respondents' perceptions of risk were analyzed. An age difference was displayed in regard to product labels which contained unfamiliar words. A larger percent of older adults were influenced by the occurrence of unfamiliar words in the warning labels than younger adults. This finding is not surprising, considering that younger people were more familiar with both household products and over-the-counter drugs than older people. Thus, the older group may have encountered more unfamiliar words as they read the product warning labels and may have been influenced more by this factor than the younger group. As would be expected, the likelihood of suffering an injury or illness resulting from the use of a product and the severity of a possible injury or illness were most frequently reported by both age groups as influential components in ratings of perceived risk.

Conclusions. Age differences do exist in risk perception of hazardous information presented in warning labels. Older adults generally display more cautious behavior and an overall higher perception of risk. These findings are in accord with previous research pertaining to age discrepancies encountered by Otani, Leonard, Ashford, Bushroe, and Reeder (1992). Overall, it is hypothesized that the results may stem from the changes, usually declines, in physical, perceptual, and cognitive capacities that older people experience as they age, thereby increasing their susceptibility to illness and injury. Stronger feelings of vulnerability may then lead to an intensified level of perceived risk.

Aside from age discrepancies, perception of risk also differs according to the type of product which displays the warning label. Over-the-counter drugs did not elicit a higher degree of perceived risk, in spite of the fact that they are typically consumed internally and were found to be less familiar among the studied population than household products. Lack of familiarity with products can lead to intensified levels of perceived risk (Desaulniers, 1989), yet this tendency was not displayed in ratings of risk for drugs. Otani, Leonard, Ashford, Bushroe, and Reeder (1992) also witnessed this counter-intuitive pattern of results. It is possible that the level of familiarity in the stimuli presented must differ by a larger degree in order to replicate the findings in Desaulniers' research (1989). The possibility warrants further examination.

Older people were hypothesized to be more familiar with over-the-counter drugs than younger people, whereas equal levels of familiarity were expected to be revealed when household products were considered (See Figure 3). However, this interaction effect failed to arise, not surprisingly, when one considers the main effect regarding familiarity. Older



adults are less familiar with both over-the-counter drugs and household products than younger adults (See Figure 4).

In yet another dimension of risk, age differences in perceived risk were revealed. Younger adults underestimated the risk involved in the act of combining a cleaning product with other household chemicals, again displaying less cautious behavior than older adults (Otani, Leonard, Ashford, Bushroe, and Reeder, 1992). As follows, younger people were expected to underestimate the severity of a potential injury or illness resulting from the harmful combination of a household product and other chemicals. Younger and older groups both estimated the severity of possible consequences as only somewhat severe. It seems the two age groups are not fully cognizant of the serious effects of fumes which are released when household chemicals are combined.

Perceptions of risk which vary according to age groups bear practical implications for observers outside the academic realm. The fact that older adults maintain a heightened level of perceived risk compared to younger adults creates a difficult challenge for manufacturers of warning labels, particularly household products. Wogalter, Godfrey, Fontanelle, Desaulniers, Rothstein, and Laughery (1987) found that the presence of hazard statements and consequences of improper product use elicits greater effectiveness of warning labels. If possible, a balance should be struck between minimizing the potential danger involved in a product's proper use and over-exaggerating hazards to the extent that consumers become overly fearful. It is apparent that the two age groups in this research do not share similar perceptions of risk of household products (see Table 3). This evidence highlights the importance of alerting consumers of all ages in advance of the potential danger

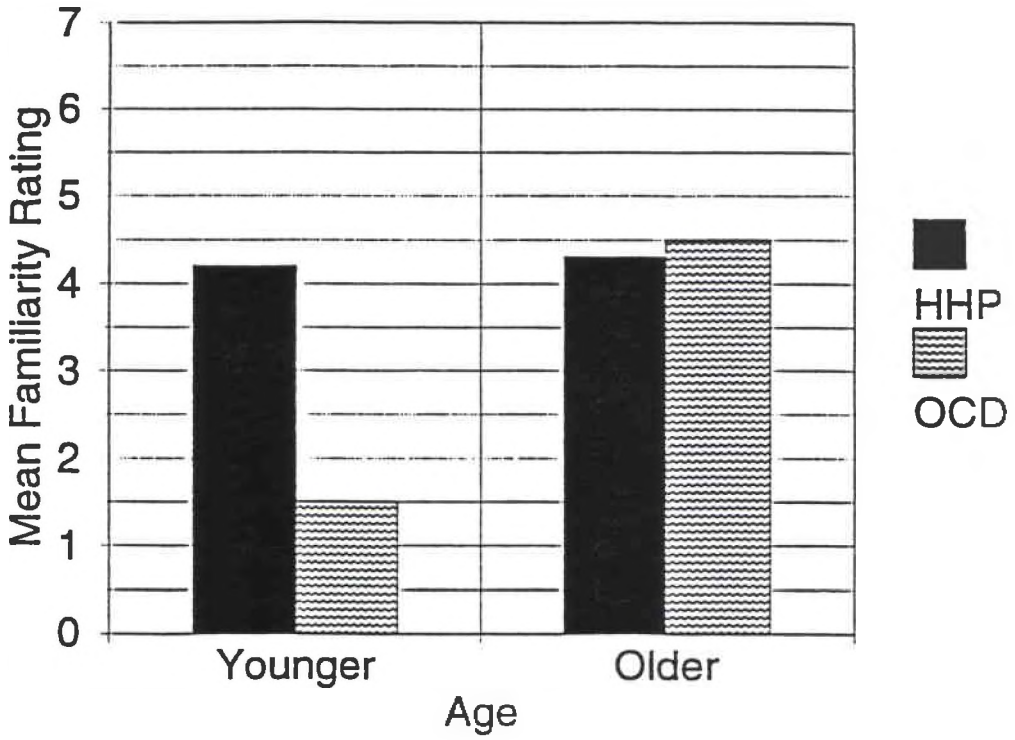


Figure 3. Predicted Ratings of Familiarity as a Function of Age Group and Product Type.

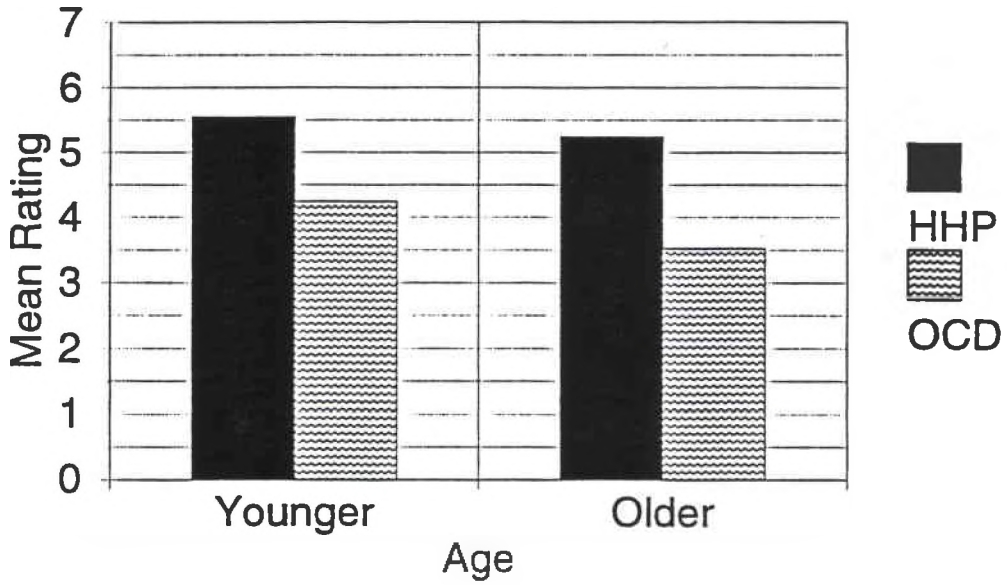


Figure 4. Not Significant Mean Ratings of Familiarity as a Function of Age Group and Product Type.

and hazards involved during a household product's use, particularly improper use. In order to increase awareness of this risk when household products are used improperly, it is recommended that manufacturers use more severe language for household products which are more dangerous (i.e., mineral and rust remover) than others (i.e., glass cleaner and floor wax).

In the use of a household product such as bleach, individuals may easily underestimate the potential dangers unless the hazard information is displayed in a prominent manner. As previously stated, this information should alert consumers of the harmful results of improper usage of household products, namely the formation of chlorine gas. These fumes can be quite strong and when inhaled, cause headaches, burning sensations in the lungs, eyes, and nose (Bettman, Payne, and Staelin, 1987). Inhalation of hydrochloric gas may even cause an individual to lose consciousness. While manufacturers of household products usually do warn against combining household products with other chemicals, it is recommended that they include information regarding the potentially severe consequences in the hazard statements of warning labels. For instance, labels of bleach products should contain the following consequence portion: "HAZARD: DO NOT USE OR MIX WITH AMMONIA, TOILET BOWL CLEANERS, VINEGAR, ACIDS, OR OTHER HOUSEHOLD CHEMICALS. TO DO SO WILL RELEASE HAZARDOUS GASES WHICH MAY CAUSE HEADACHES, BURNING SENSATIONS IN LUNGS, EYES, AND NOSE, OR UNCONSCIOUSNESS."

Manufacturers of household products are also challenged by the fact that numerous products are reusable (i.e., toilet bowl cleaners). As stated earlier, the dilemma in the design

of warning labels is that warnings become less useful as the household products are reused. Warnings are then less practical for several reasons. According to Godfrey and Laughery (1984), the warning on a reusable product is less likely to draw attention and be read than a non-reusable product (cited in Rothstein, 1985). Second, a container other than the original one may hold the product; therefore, the warning no longer exists. Finally, although the original container may be present and the individual is willing to read the warning, the actual product label may no longer be intact. For these reasons, Rothstein (1985) recognized the importance of designing warnings to facilitate the acts of reading and remembering.

While it is clear that discrepancies regarding different age groups and product types exist in ratings of perceived risk in warning labels, recommendations can be made for further research in this area. It is uncertain how older people who do not live autonomously or do not have above average health would respond to the same types of product warning labels. Other questions which remain unanswered are how warning labels of other product types would be rated in terms of perceived risk, and how age groups other than the two described in this research would respond.

In order to address these questions, future studies in risk perception should follow the methodology used in the present research. Through the use of a demographics questionnaire, three age groups, one young, one middle-aged, and one older, should be matched on gender and education level. Elderly people with reported average or below average health conditions should be included in the oldest group. All participants should be given a questionnaire booklet consisting of typed product warning labels and questions to assess their perceived level of risk. The warning labels should be verbatim reproductions

of actual product labels from common household products and over-the-counter drugs. This methodology should be repeated with warning labels from other types of products, such as electronic appliances (i.e., portable heaters) and chemicals used outside the home (i.e., insecticides).

In summary, previous findings have been confirmed, however, regarding age differences and effects of familiarity. Older people tend to exhibit more guarded behavior and are less likely to disregard precautions on warning labels than younger people. Lack of familiarity with certain products among the two age groups did not lead to intensified perceptions of risk, however. Regardless of familiarity with household products, older adults are more aware of the risk involved in the act of combining a cleaning product with other household chemicals than were younger people. Younger and older groups both seem to be unaware of the serious effects of fumes which are released when household chemicals are combined. As a result, manufacturers of household products and their warning statements are greatly challenged.

## APPENDIX A

## INFORMED CONSENT TO PARTICIPATE AS A RESEARCH SUBJECT

Project Title: Warning labels

Investigators: Janet Herries and Laura Militello

## Description and Duration of Experiment:

For this study, you will be asked to read the information contained in warning labels of various products and fill out a questionnaire. All answers will be recorded in the questionnaire booklet by circling the appropriate number on a 7-point scale.

No adverse effects have been reported in previous experiments of this type.

We anticipate that the questionnaire will take 45 minutes to complete. Students will receive one hour of credit in partial fulfillment of their Psychology 101 research requirement. Participants may voluntarily terminate their participation at any time and still receive full credit.

## Confidentiality of Data:

All records of your participation in this study will not be disclosed to others. Your name will not be revealed in any document resulting from this experiment.

## Contact Person for Questions or Problems after the Experiment:

Participants who have questions or problems in regard to this experiment may contact Janet Herries at the University of Dayton, SJ 313, 229-2175, or Greg Elvers, SJ 312, 229-2171.

## Consent to Participate:

I have voluntarily decided to participate in this experiment. One or more of the investigators named above has adequately answered any and all questions I have about this experiment, the procedures involved, and my participation. I understand that one of the investigators named above will be available to answer any questions about experimental procedures throughout the experiment. I also understand that I may voluntarily terminate my participation in this experiment at any time and still receive full credit (1 hour) toward fulfillment of the Psychology 101 research requirement. I also understand that the investigators named above may terminate my participation in this study if they feel this to be in my best interest. In addition, I certify that I am 17 (seventeen) years of age or older.

---

Signature of Participant

Date

---

Signature of Witness

Date

## APPENDIX B

## DEMOGRAPHICS QUESTIONNAIRE

**Instructions:** Please respond to the questions with the most appropriate answer.

1. When were you born? Month \_\_\_\_\_ Year \_\_\_\_\_
2. What is your highest educational grade completed (please circle the correct response) ?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17+  
Primary School High School College

3. Briefly describe all previous employment/occupations held:  
(You do not need to list employers' names here)

---

---

---

---

4. Are you currently taking any prescription medication? If yes, please list medication.

---

---

---

---



5. Are you currently taking any over-the-counter medications for colds or coughs? If yes, please list medication.

---

---

---

6. Please circle the word which best describes your current general health:

Poor      Fair      Good      Very Good      Excellent

7. Please mark the phrase that best describes you.

I am a student

I am currently employed and not retired

I am retired

I am retired but work part-time

I am retired and do volunteer work

**PARTICIPANT INFORMATION**

**Please note that this information is requested so that the researchers can contact you with the results of the research project. ALL INFORMATION WILL BE KEPT CONFIDENTIAL!**

**Name** \_\_\_\_\_

**Address** \_\_\_\_\_

**Phone** \_\_\_\_\_

**APPENDIX C**  
**INSTRUCTIONS**

Thank you for participating in our study. We would like to get your reactions to a number of product labels. Please take as much time as needed to complete this questionnaire thoughtfully.

On the first page of your booklet, you will find a brief product description accompanied by a warning label. On the opposite page, there will be eight questions. Please answer each question as if you were the person using the product. Use the 7-point scale and circle the appropriate number. Continue until the booklet is complete.

If you have any questions now or as you fill out this questionnaire, please do not hesitate to ask.

Once again, thank you for your participation. It is greatly appreciated.

Janet Herries

Laura Militello

## Appendix D

### Detergent Ammonia

Use: For general cleaning of windows, mirrors, floors, rugs & upholstery, garbage pails, and toilet bowls.

**CAUTION: CONTAINS AMMONIA**

#### **FIRST AID**

**INTERNAL: GIVE WATER OR MILK (UP TO 4 OUNCES) IMMEDIATELY. DO NOT INDUCE VOMITING. CALL PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY.**

**EXTERNAL: FLOOD WITH WATER.**

**EYES: WASH THOROUGHLY WITH WATER, PREFERABLY WARM, FOR 15 MINUTES. GET PROMPT MEDICAL ATTENTION.**

**IMPORTANT: DO NOT SOAK ALUMINUM UTENSILS IN AMMONIA. DO NOT MIX WITH CHLORINE TYPE BLEACHES OR OTHER HOUSEHOLD CHEMICALS.**

**KEEP OUT OF REACH OF CHILDREN.**

**AVOID CONTACT WITH SKIN AND EYES.**

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

## Drain Opener

Use: For clogged or slow running drains in pipes, disposers, and septic tanks.

**DANGER:** KEEP OUT OF REACH OF CHILDREN. INJURES EYES, SKIN, AND MUCOUS MEMBRANES ON CONTACT. HARMFUL IF SWALLOWED. Do not use with ammonia, toilet bowl cleaners or other drain openers as splashing or the release of hazardous gases may occur.

**EMERGENCY TREATMENT:** EYES - Flush immediately with water for 15 minutes. If wearing contact lenses, remove first. EXTERNAL - Wash immediately with water. INTERNAL - Drink a glassful of water. Do not induce vomiting. IN ALL CASES, CALL PHYSICIAN.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

## Dishwashing Liquid

Use: Cleans dishes, silverware, and utensils.

**CAUTION:** Not for use in automatic dishwasher. Do not mix with chlorine bleach or other household cleaning products.

**AVOID ACCIDENTS:** Keep out of reach of children. If dishwashing liquid gets in your eyes, rinse thoroughly with water. If swallowed, drink a glass of water to dilute.



**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

**Bleach**

**Use:** Removes stains, cleans, deodorizes in washing machines, floors, tile, sinks, bathtubs, toilet bowls, showers, and appliances.

**CAUTION:** WILL IRRITATE EYES AND SKIN. HARMFUL IF SWALLOWED. DO NOT GET ON CLOTHING. KEEP OUT OF REACH OF CHILDREN.

**TREATMENT:** IF SPLASHED IN EYES, FLUSH WITH PLENTY OF WATER. CALL A DOCTOR. IF SWALLOWED, DRINK ONE TO TWO GLASSES OF WATER OR MILK. DO NOT INDUCE VOMITING. AVOID ALCOHOL. IMMEDIATELY CALL A DOCTOR OR THE LOCAL POISON CENTER.

**HAZARD:** DO NOT USE OR MIX WITH AMMONIA, TOILET BOWL CLEANERS, VINEGAR, ACIDS, OR OTHER HOUSEHOLD CHEMICALS, TO DO SO WILL RELEASE HAZARDOUS GASES. DO NOT USE ON COPPER, ALUMINUM, IRON, SILVERWARE OR OTHER METAL OBJECTS.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

### Glass Cleaner

Use: Cleans glass surfaces, mirrors, appliances, counter tops, stainless steel, and fiberglass.

**CAUTION: THIS SOLUTION CONTAINS ISOPROPANOL, SOLVENT AND A WETTING AGENT.**

**DO NOT MIX WITH OTHER CHEMICALS. KEEP OUT OF REACH OF CHILDREN. MAY BE HARMFUL IF SWALLOWED.**

**IN CASE OF EYE CONTACT rinse thoroughly with water to reduce irritation.**

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

**Powdered Cleanser with Bleach**

**Use:** Cleans and deodorizes sinks, tubs, tile, stainless steel and chrome fixtures.

**CAUTION:** Eye Irritant. In case of eye contact, flush with water. To avoid harmful fumes, do not mix with ammonia or other household cleaning products. Keep out of reach of children. If swallowed, give a glass of milk or water. Do not induce vomiting. Call a physician or poison control center. If splashed in eyes flush thoroughly with water. If irritation persists call a physician or poison control center.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

### Toilet Bowl Cleaner

Use: Cleans, deodorizes and removes stubborn rust and hard water stains in toilet bowls.

**DANGER: CORROSIVE.** Contains hydrochloric acid. May be fatal if swallowed. Do not breathe vapors. Use in a well-ventilated area. Produces chemical burns. Do not get in eyes, on skin or clothing. **DO NOT MIX WITH chlorine bleach, ammonia, cleaners or other household chemicals. KEEP OUT OF REACH OF CHILDREN.**

**FIRST AID: IF SWALLOWED:** Drink promptly large quantities of water. Do not induce vomiting. Avoid alcohol. Never give anything by mouth to an unconscious person. Get prompt medical attention. **IF ON SKIN:** Flush with plenty of soap and water. Remove contaminated clothing and wash before reuse. Get medical attention if irritation persists. **IF IN EYES:** Flush immediately with cool water. Remove contact lenses. Continue flushing for 15 minutes. Call a physician immediately.



**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

## Mineral & Rust Remover

**Use:** Removes mildew stains and rust on bathroom sinks, tubs, showers, tiles, and toilet bowls.

### **WARNINGS:**

- \* Do not mix or use with any other household cleaning products, including bleach, mildew stain removers and toilet bowl cleaners, as toxic fumes may result. If such fumes do occur, immediately move to fresh air.
- \* Harmful if swallowed.
- \* Do not remove the cap from the bottle and do not use any other sprayers with bottle.
- \* Use only in well ventilated areas as prolonged breathing of vapors may be irritating. If vapors bother you, leave the room while the remover is working.
- \* Avoid contact with eyes, or prolonged contact with skin.  
**KEEP OUT OF REACH OF CHILDREN.**

**FIRST AID:** If swallowed, do not induce vomiting. Immediately rinse mouth, then drink 1 or 2 large glasses of water or milk. Do not give carbonates or bicarbonates. Contact a poison control center or get medical attention immediately. For skin contact, flush thoroughly with cool running water. For contact with eyes, immediately flush with cool running water for at least 15 minutes. If irritation occurs, contact a physician.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to mix the contents of this product with other household chemicals?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to mix the contents of this product with other household chemicals, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

**Extra Strength Antacid/Anti-Gas Liquid**

**Use:** For fast relief of acid indigestion, heartburn, sour stomach, and gas

**Warnings:** Do not take more than 12 teaspoonsful in a 24-hour period or use the maximum dosage for more than 2 weeks or use if you have kidney disease except under the advice of a physician. **Drug Interaction Precaution:** Do not use if you are taking a prescription antibiotic drug containing any form of tetracycline. Keep this and all drugs out of the reach of children.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

**Milk of Magnesia Laxative/Antacid**

**Use:** To relieve constipation

**Warnings:** Do not take any laxative if abdominal pain, nausea, vomiting, change in bowel habits persisting for over two weeks, rectal bleeding or kidney disease are present. Laxative products should not be used for a period longer than 1 week, unless directed by a physician. If there is a failure to have a bowel movement after use, discontinue and consult your doctor. Keep this and all drugs out of reach of children. In case of accidental overdose, seek professional assistance or contact a poison control center immediately. As with any drug, if you are pregnant or nursing a baby, seek the advice of a health professional before using this product.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

**Muscle Relaxant/Pain Reliever**

**Use:** For the prevention and relief of night leg cramps

**Warning:** Do not take if pregnant or nursing a baby. This product is not intended for those sensitive to quinine or under 12 years of age. Discontinue use and consult your physician if ringing in the ears, deafness, diarrhea, nausea, skin rash, bruising or visual disturbances occur. In case of accidental overdose, seek medical assistance or contact Poison Control Center immediately. Keep this and all medicine out of reach of children.



**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

**Antacid Tablets**

**Use:** Chewable tablets for the relief of acid indigestion, heartburn, sour stomach, and gas

**Warning** Do not take more than 16 tablets in a 24-hour period or use the maximum dosage of this product for more than two weeks, except under the advice and supervision of a physician. Keep out of the reach of children. - Safety Sealed - Do not purchase if foil wrapping is damaged.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

## Cough Control Syrup with Diphehydramine

Use: To suppress coughing

**WARNINGS:** May cause marked drowsiness. Do not give to children under 6 years of age except under the advice and supervision of a physician. May cause excitability, especially in children. Do not take this product for persistent or chronic cough such as occurs with smoking, asthma, emphysema, or when cough is accompanied by excessive secretions, or if you have epilepsy, glaucoma, or difficulty in urination due to enlargement of the prostate gland except under the advice and supervision of a physician

As with any drug, if you are pregnant or nursing a baby, seek the advice of a health professional before using this product. **KEEP THIS AND ALL DRUGS OUT OF REACH OF CHILDREN.** In case of accidental overdose, seek professional assistance or contact a Poison Control Center immediately.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

### Stomach Pain Reliever with Coating Action

Use: For relief of indigestion, diarrhea, heartburn, upset stomach, and nausea

**WARNING:** Children and teenagers who have or are recovering from chicken pox or flu should not use this medication to treat nausea or vomiting. If nausea or vomiting is present, consult a doctor because this could be an early sign of Reye Syndrome, a rare but serious illness. Also, as with any drug, if you are pregnant or nursing a baby, seek the advice of a health professional before using this product.

**CAUTION:** This product contains salicylates. If taken with aspirin and ringing in the ears occurs, stop using. This product does not contain aspirin, but if you are allergic to aspirin do not use as an adverse reaction may occur. If taking medicines for anticoagulation (*thinning the blood*), diabetes, or gout, consult a physician before taking this product. If diarrhea is accompanied by a high fever or continue more than 2 days, consult a physician. **NOTE:** The beneficial medication may cause a temporary and harmless darkening of the tongue or stool.

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

### Cold, Allergy, Sinus Medicine in Liquid Form

Use: For the relief of cold, allergy and sinus symptoms

**WARNINGS:** Keep this and all drugs out of the reach of children. In case of accidental overdose, seek professional assistance or contact a Poison Control Center immediately. Prompt medical attention is critical for adults as well as for children even if you do not notice any signs or symptoms. Do not take this product if you have heart disease, high blood pressure, thyroid disease, diabetes, asthma, glaucoma, emphysema, chronic pulmonary disease, shortness of breath, difficulty in breathing, or difficulty in urination due to enlargement of the prostate gland or are taking a prescription drug for high blood pressure or depression or are taking sedatives or tranquilizers unless directed by a doctor. Do not exceed the recommended dosage because at higher doses nervousness, dizziness, or sleeplessness may occur. Do not take this product if you are taking another medication containing phenylpropanolamine. May cause drowsiness; alcohol, sedatives and tranquilizers may increase the drowsiness effect. Avoid alcoholic beverages; use caution when driving motor vehicle or operating machinery. May cause excitability especially in children. Do not take this product for more than 7 days. If symptoms do not improve, new ones occur, or if fever persists for more than 3 days (72 hours) or recurs, consult a doctor. As with any drug, if you are pregnant or nursing a baby, seek the advice of a health professional before using this product.



**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Familiar			Familiar			Familiar

## Aspirin

Use: For fast pain relief of headache, pain and fever of colds and flu, muscle aches and pains, menstrual pain and toothaches. Also for the temporary relief from minor aches and pains of arthritis and rheumatism

**WARNINGS: CHILDREN AND TEENAGERS SHOULD NOT USE THIS MEDICINE FOR CHICKEN POX OR FLU SYMPTOMS BEFORE A DOCTOR IS CONSULTED ABOUT REYE SYNDROME, A RARE BUT SERIOUS ILLNESS REPORTED TO BE ASSOCIATED WITH ASPIRIN. KEEP THIS AND ALL DRUGS OUT OF THE REACH OF CHILDREN. IN CASE OF ACCIDENTAL OVERDOSE, SEEK PROFESSIONAL ASSISTANCE OR CONTACT A POISON CONTROL CENTER IMMEDIATELY. AS WILL ANY DRUG, IF YOU ARE PREGNANT OR NURSING A BABY, SEEK THE ADVICE OF A HEALTH PROFESSIONAL BEFORE USING THIS PRODUCT. IT IS ESPECIALLY IMPORTANT NOT TO USE ASPIRIN DURING THE LAST 3 MONTHS OF PREGNANCY UNLESS SPECIFICALLY DIRECTED TO DO SO BY A DOCTOR BECAUSE IT MAY CAUSE PROBLEMS IN THE UNBORN CHILD OR COMPLICATIONS DURING DELIVERY.**

**ANSWER ALL QUESTIONS AS IF YOU WERE THE PERSON USING THE PRODUCT.**

1. How familiar are you with this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
2. How likely are you to take the precautions listed on the label?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
3. How likely is it that you would suffer an injury or illness as a result of using this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
4. If you had an injury or illness as a result of using this product, how severe do you think it would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
5. How risky do you think it is for you to use this product?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
6. How risky do you think it would be to exceed the recommended dosage with this type of drug?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	
  
7. If you were to exceed the recommended dosage of this drug, how severe do you think the resulting illness or injury would be?  

1	2	3	4	5	6	7
Not at all			Somewhat		Very	
Familiar			Familiar		Familiar	

## APPENDIX E

Please check which of the following factors, if any, influenced your perception of risk:

- \_\_\_\_\_ Length of warning label
- \_\_\_\_\_ Unfamiliar words in warning labels
- \_\_\_\_\_ Chemical names in warning labels
- \_\_\_\_\_ Typical use of product (for example, swallowed vs. external use)
- \_\_\_\_\_ Ease of compliance with precautions listed on labels
- \_\_\_\_\_ Severity of consequences resulting from improper use of product
- \_\_\_\_\_ Likelihood of injury or illness in use of product

## APPENDIX F

## DEBRIEFING STATEMENT FOR THE RISK PERCEPTION EXPERIMENT

This experiment asked you to use information on warning labels regarding the hazards associated with over-the-counter drugs and common household products. Warning labels such as these are provided to inform consumers of products to be aware of the significance of this information and heed the product warnings. However, previous research has shown that warnings are often disregarded.

The results of this study will be used to better understand the effectiveness of warning labels. In addition, we are interested in understanding the risk perception connected with the use of drugs and household products. We predicted that the perceived risk would be greater with drugs than with household products. Furthermore, we also predicted that the likelihood of following precautions included in the warning labels would be greater with drugs than household products.

Two different age groups were used in this study in order to determine whether warning labels are more effective in one age group than another. We anticipate that older people will be more familiar with drug warning labels, having encountered a greater amount than younger people. Additionally, we expect younger people to be more likely to disregard warning labels and view them as exaggerations of hazards.

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**APPENDIX G**  
**ANALYSIS OF VARIANCE TABLES**

**Table G-1**  
**ANOVA Summary Table for Mean Ratings of Familiarity**

<b>Source</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Squares</b>	<b>F</b>	<b>Sig. of F</b>
<b>Age</b>	6.38	1	6.38	5.80	0.018
<b>Product Type</b>	55.50	1	55.50	50.43	<.0005
<b>Age x Product Type</b>	0.99	1	0.99	.90	0.345
<b>Within Cells</b>	101.26	92	1.10		

**Table G-2**  
**ANOVA Summary Table for Mean Ratings of Likelihood of Taking Precautions**

<b>Source</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Squares</b>	<b>F</b>	<b>Sig. of F</b>
<b>Age</b>	7.31	1	7.31	5.88	0.017
<b>Product Type</b>	3.28	1	3.28	2.64	0.108
<b>Age x Product Type</b>	1.76	1	1.76	1.42	0.237
<b>Within Cells</b>	114.50	92	1.25		

**Table G-3**  
**ANOVA Summary Table for Mean Ratings of Likelihood of Suffering an Injury**

Source	Sum of Squares	DF	Mean Squares	F	Sig. of F
Age	2.88	1	2.88	2.30	0.133
Product Type	0.33	1	0.33	0.26	0.609
Age x Product Type	15.33	1	15.33	12.24	0.001
Within Cells	115.26	92	1.25		

**Table G-4**  
**ANOVA Summary Table for Mean Ratings of Severity of Injury/Illness**

Source	Sum of Squares	DF	Mean Squares	F	Sig. of F
Age	5.75	1	5.75	4.27	0.042
Product Type	0.51	1	0.51	0.38	0.540
Age x Product Type	1.63	1	1.63	1.21	0.275
Within Cells	123.79	92	1.35		

**Table G-5**  
**ANOVA Summary Table for Mean Ratings of Overall Perceived Risk**

<b>Source</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Squares</b>	<b>F</b>	<b>Sig. of F</b>
Age	6.89	1	6.89	6.61	0.012
Product Type	0.71	1	0.71	0.68	0.410
Age x Product Type	18.79	1	18.79	18.01	<.0005
<b>Within Cells</b>	<b>95.98</b>	<b>92</b>	<b>1.04</b>		

**Table G-6**  
**ANOVA Summary Table for Mean Ratings of Risk in Combining Household Products**

<b>Source</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Squares</b>	<b>F</b>	<b>Sig. of F</b>
Age	3.59	1	3.59	5.53	0.023
<b>Within Cells</b>	<b>29.83</b>	<b>46</b>	<b>0.65</b>		



**Table G-7**  
**ANOVA Summary Table for Mean Ratings of Severity of Potential Injury/Illness**  
**for Household Products**

Source	Sum of Squares	DF	Mean Squares	F	Sig. of F
Age	3.06	1	3.06	3.32	0.075
Within Cells	42.41	46	0.92		

**Table G-8**  
**Analysis of Simple Effects of Ratings of Likelihood of Suffering Injury/Illness**

Source	Sum of Squares	DF	Mean Squares	F	Sig. of F
Within Cells	68.82	46	1.50		
Product Type x Age (Older)	10.08	1	10.08	6.74	0.013
Within Cells	46.44	46	1.01		
Product Type x Age (Younger)	5.58	1	5.58	5.53	0.023

**Table G-9**  
**Analysis of Simple Effects on Ratings of Overall Perceived Risk**

<b>Source</b>	<b>Sum of Squares</b>	<b>DF</b>	<b>Mean Squares</b>	<b>F</b>	<b>Sig. of F</b>
<b>Within Cells</b>	<b>61.11</b>	<b>46</b>	<b>1.33</b>		
<b>Product Type x Age (Older)</b>	<b>13.41</b>	<b>1</b>	<b>13.41</b>	<b>10.10</b>	<b>0.003</b>
<b>Within Cells</b>	<b>34.87</b>	<b>46</b>	<b>0.76</b>		
<b>Product Type x Age (Younger)</b>	<b>6.09</b>	<b>1</b>	<b>6.09</b>	<b>8.04</b>	<b>0.007</b>

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